PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Vol. 113, No. 9 Thursday, August 28, 1941 Price Ten Cents

B. C. Pulp & Paper Co. To Increase Output

New Program Just Announced By Lawrence Killam, President, Will Expend $750,000 In Expansion At Company's Two Mills — Production of Bleached Sulphite and Rayon Pulp To Be Increased.

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., August 25, 1941—Lawrence Killam, president of the British Columbia Pulp and Paper Company, Vancouver, B. C., announced a program of plant expansion at the company's two mills, located at Port Alice, B. C., and Woodfibre, B. C., involving total expenditure of $750,000.

The appropriation is being made under special authority of the Canadian Government in recognition of the importance of the pulp and paper industry in the nation's wartime economy.

Under similar conditions the Powell River Company was permitted last month to proceed with expenditure of $980,000 on extension of its unbleached sulphite facilities.

The new program of the British Columbia Pulp and Paper Company, which only four years ago carried out far-reaching plant improvements at a cost of about $1,000,000, will result in increasing production of bleached sulphite and rayon pulp by 40 tons daily at each of the mills.

New Digesters To Be Installed

Despite the substantial outlay involved, the company is practicing the utmost economy in carrying out its expansion. The new digesters to be installed were originally constructed for the Lake Sulphite Paper Company formed several years ago in Ontario to produce pulp on a large scale, but which subsequently went into liquidation before turning a wheel.

For the Woodfibre plant a boiler and 2000-kilowatt steam turbine which previously served the Granby Consolidated Mining, Smelting and Power Company at Anyox, has been obtained. The Anyox copper plant was dismantled several years ago and some of the machinery was sold to the Consolidated Mining and Smelting Company.

The digesters will be erected by the Dominion Bridge Company, while Dominion Construction Co., Vancouver, has been awarded the contract for constructing the buildings to house them.

Preliminary work on some of the minor phases of the construction program are already under way, says Mr. Killam, and it is expected that both mills will be in full production at their increased capacity early next year.

Since the company withdrew from the Oriental markets, the British Columbia Pulp and Paper Company has sold most of its output in the United States, and it is estimated that the company's revenues from sales in that field on the new basis will be approximately $1,000,000 a year.

To Produce Bleached Sulphite and Rayon Pulp

The company's 1937 construction plan resulted in swinging the mills over to exclusive production of bleached sulphite and rayon pulp. Prior to that time, the company had also produced unbleached sulphite. This change is indicative of a pronounced trend in the west coast pulp industry towards expansion to meet the increasing market requirements of wartime.

In addition to the $980,000 program at the Powell River Company to enable the Pacific coast's premier newsprint producer to increase its production of unbleached pulp, the Westminster Paper Mills at New Westminster, B. C., are now proceeding with new construction and machinery installations amounting to some $200,000.

At Ocean Falls, Pacific Mills, Ltd., a subsidiary of the Crown Zellerbach Corporation, has spent a considerable sum during the past spring and summer on new housing. At Port Mellon, the Vancouver Kraft Corporation swung back into production several months ago after a long shutdown due to collapse of the Japanese market, and is currently producing kraft at the rate of about 85 tons daily.

Since the first of the year British Columbia's pulp and paper industry has authorized expenditures of close to $2,250,000.

Country's Industry Set Record Last Year

Last year the industry set an all-time high in value of production—$22,971,000, compared with the ten-year average of $14,270,000. When present expansion plans are completed it is expected that production will be at the rate of at least $25,000,000 annually, in contrast with barely $11,000,000 during the slump year of 1938.

Higher Canadian Newsprint Price in Doubt

Importance of Maintaining Parity Between United States and Canadian Prices May Be Determining Factor In Keeping $50 Per Ton Price For Balance of Year—Mills To Make Announcement.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 25, 1941—Canadian newsprint prices for the final quarter of the current year is a lively topic in financial circles and within the industry itself. The announcement of the Great Northern Paper Company indicating a raise of $1 to $50 a ton New York delivery, for the final quarter of 1941, gave a fillip to the discussions. It greatly accentuated an already difficult problem. It placed the Canadian newsprint industry face to face with the necessity of deciding immediately whether it would continue the policy of allowing a price differential of at least a dollar a ton, as between Canadian mills selling to United States publishers and United States mills selling to the same group, or accept the new situation which places the Canadian and American mills on the same basis, and take a chance on getting sufficient new business to compensate for the steadily advancing costs of production.

Discussion of Higher Prices Continues

As indicated two weeks ago, the question of a price advance for the final quarter of the year was already being discussed, with considerable division of opinion. There was no disputing the fact that advancing costs indicated an advance in prices, but the fortuitous situation with respect to international exchange, which allowed Canadian mills a 10% premium on United States sales, gave support to those who maintained that it was better policy to keep the price as low as possible. Now, however, it is maintained by some, the production costs, together with higher taxation, have overtaken the exchange advantage and unless there is a greater gain in sales to American publishers than is indicated, there should be an advance in the price of newsprint.

The Great Northern Paper Company has long been a chief competitor of Canadian mills and has usually been able to undersell them in the United States market by a dollar or so a ton. It is considered significant that the Great Northern has now advanced its price for newsprint from $49 to $50 a ton for the last quarter of the year. To those who favor a higher price it means additional evidence that such a change is necessary and to those who oppose the change the action of Great Northern means an exceptional opportunity to acquire a greater sales volume in the United States market.

In the past few years there has always been a differential of from $1 to $2 a ton in favor of Great Northern Paper and allied mills in the United States, as against the Canadian mills, International Paper and a few other American manufacturers.

This has ben a disturbing factor in the relations between Canadian mills and American publishers. Undoubtedly it has meant that certain business which would otherwise have come to Canada has been placed with the lower priced American mills.

By not changing the price during the last quarter the Canadian mills will be on a parity with the Great Northern price, a point which would add considerably to the strength of the Canadian product in the American market.

This is a very important consideration and will weigh heavily in all discussions regarding the price to be set for the last three months of the year.

It is apparent that Great Northern, which has benefited very considerably in the past from its price policy, would not advance its price $1 a ton, under these circumstances, unless it felt that conditions made the change imperative. Such being the case, it would appear then that there was even more justification for Canadian mills revising the price schedule upward.

During the first half of the year Great Northern Paper earned $1.29 a share on its capital stock. This compared with $1.43 for the same period of 1940. International Paper and Power, which has adhered to the $50 price policy, reported net profits in the first six months of 1941 at $2.55 a share, as against $2.74 a share for the same period in 1940.

This similarity, however, does not go any further. Great Northern's newsprint mills has been operating at full capacity for some time and on overhead and other fixed charges is considerably favored. International Paper's mills in Canada, as well as others located in this country, have been operating at considerably less than capacity, currently around 70%, so that their overhead and other charges per ton of output are higher than those of Great Northern Paper.

Advocates of a price increase for Canadian mills will have no trouble in arguing successfully that if Great Northern, operating at 100% capacity, finds it necessary to advance prices, then the Canadian mills, operating at only 70% capacity, have even greater cause for an adjustment in the price schedule.

Market Relations a Desirable Factor

From all this it does not appear that there is much in the way of a price increase for Canadian mills; but, on the other hand, the question of market relations is likely to loom large in all price discussions.

On the basis of shipments to the United States last year, each advance of $1 a ton would give the Canadian mills an additional income of around $600,000 during the last quarter of the year and more than two and a half millions over the 12-month period.

The question now becomes one of whether or not Canadian mills want to forego this half a million or more additional revenue for the final quarter, in an effort to improve their relations with the American publishers. Some are of the opinion that it would be well worth while. Moreover, it is argued that there would likely be sufficient new business to offset the loss created by a neglect to raise the price.

Apparently no one knows precisely just how many Canadian mill operators are in favor of an advance in newsprint prices at this time and how many are for a continuance of the status quo, and as far as can be ascertained they are about equally divided on the question. It may well be that there will be no change in the $50 a ton rate until the end of the year, but a decision must be made within a few days.

Heavy Paper Demand A Problem in Chicago

Government Buying and Large Scale Orders From Regular Customers Increase Difficulty of Making Deliveries of Paper and Paper Products—N.P.T.A. Meeting Well Attended—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 25, 1941—Government buying for immediate use as well as for reported future needs is forcing a problem on to local paper executives which they are at a loss to know how to solve. It is not a matter of "markets" as September comes along, as much as it is a matter of getting the paper to the one who wants it. Frequent efforts to secure more adequate information as to the prices and price ranges is an equally impossible assignment. While the industry is obviously doing all that it can to retain a semblance of prices and of order in procedure it is a hard thing to do with the immediate future so uncertain and paper so hard to obtain. This condition holds true in virtually all local markets, where separate policies adopted by various mills conform to the difficulty of filling orders when some mills are booked into the spring of 1942.

The current "strength" has extended into the waste paper market where the matter of prices is now subject to trade agreement with the OPM.

Coarse Paper Merchants Plan Outing

Chicago coarse paper merchants are looking forward to their annual golf party which has been scheduled for September 11 at the sporty Kildeer Country Club northwest of Chicago. Bob Knox, secretary-treasurer of the Chicago Paper Association which will sponsor the outing but he is going to have plenty of help from a committee headed by Hank Borchardt of the Pilcher Hamilton Company. Included in the committee in charge of arrangements not only for golf but for dinner, prizes and extraneous entertainment are Ed. Schwartz, of the Hanchett Paper Company; Joe Druth, Chippewa-Arrow Paper Company; Walter Schulman, Levin Bros. Paper Company; William Shapland, Fred Renz Paper Company; Jake Lubin, Lubin Bros. Paper Company; Henry Weinstein, Western Bag and Paper Company; William Chukerman of J. Chukerman & Sons and Leo Altholz of the Inlander-Steindler Paper Company.

N.P.T.A. Meeting Well Attended

More than one hundred paper merchants in Chicago and surrounding territory attended the regional meeting of the National Paper Trade Association held at the Bismarck Hotel in Chicago on August 8. The meeting was presided over by Robert H. Ziegler, assistant secretary of the N.P.T.A. who introduced C. W. Boyce, chief consultant of the pulp and paper unit of the OPM. After Mr. Boyce concluded his remarks, Mr. Ziegler again commented on certain problems confronting the industry and presided over an open discussion in which members of the Chicago Paper Merchants Association took a prominent part. The meeting was attended by representatives of both the coarse and fine paper jobbing industry.

Both Mr. Boyce and Mr. Ziegler commented on the amount of paper the Government was using and would use in national defense work and stressed the obvious shortages in chemicals and pulps which was certain to be the result. The importance in the caustic soda, soda ash and other chemical markets received perhaps the most attention from the speakers with the belief expressed that requirement for government use might reach 40 to 50% of the nation's paper and paper board output.

The visitors at the Chicago meeting found that the N.P.T.A., in stressing the need for coordination to preserve the functions of the paper merchant, was already preparing a program which might help somewhat in getting paper to non-defense buyers. It was also certainly indicated that the day was not far distant when the industry faced actual allocation of orders with a most certain wide shrinkage in volume. This latter position, in turn, was considered to mean that narrow pricing with a dependence upon volume to "turn the trick" would be a most dangerous and impossible task.

Whitaker Adds New Lines

The Whitaker Paper Company has recently made several additions to its representative stock including Westover Deckle in both flat stock and announcements. The announcements come in white and five colors. Another item added is Sonora Embossed Folder, a product of the Beveridge Mills.

Plan Record N.P.T.A. Meeting

Chicago merchants are already preparing for a record attendance at the annual meeting of the National Paper Trade Association to be held at the Hotel Stevens in Chicago on September 15 to 17. The association expects that the interest reflected in the recent group meetings held throughout the country will, in turn, help to swell attendance as the industry faces what many veterans consider to be one of the most critical times in its history. The seriousness of the defense situation, the matter of priorities, of taking care of normal customer requirements as government demand swells to unexpected heights is not expected to detract in any way from the success of the annual exhibits which have become a feature of the N.P.T.A. Fall program. Already a record number of paper firms have arranged for exhibits which will again be carefully segregated to permit careful inspection and a most adequate arrangement of stock.

Crescent Paper Plant Demolished

PHOENIX, N. Y., August 25, 1941—The buildings in this city formerly occupied by the Crescent Paper and Machine Company are being demolished by a large wrecking crew. The mill was founded in 1906 by C. D. Ash and the late Smith Murgittroyd and operated by them in the manufacture of paper for over twenty years. Since they relinquished control it was for a number of years operated by the Hollingsworth Paper Company. The equipment of the original mill was sold by the founders about fifteen years ago to various paper concerns in this country and South America.

To Build Power Plant on Wisconsin River

Consolidated Water Power & Paper Co. Will Start Work Soon On New Dam and Hydro-Electric Plant To Cost $1,500,000 — New Unit Will Generate 43,000,000 Kilowatt Hours—Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 25, 1941—To help meet the acute shortage of electrical energy becoming more evident daily, the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., will begin immediate construction of a new dam and hydro-electric plant on the Wisconsin River at Knowlton, Wis., according to announcement made by George W. Mead, president. The cost of the construction, exclusive of lands, will be approximately $1,500,000.

The schedule calls for work to start within a week and it will continue until March, 1942, by which time it is expected the dam will be sufficiently completed so the waters may be impounded. Construction of the power plant will follow, and it is expected that the generating equipment, including turbines, will be ready for operation by the fall of 1942.

New Unit Will Provide 10,500 Horsepower

The unit will have a generating capacity of 10,500 hp., or 43,000,000 kilowatt hours of electricity annually. The plant will be tied in with the lines of the Wisconsin Public Service Corporation at Knowlton, thus making it available to all paper mills and other industries in the Wisconsin River Valley.

Construction will be undertaken by the Consolidated's own organization, under the direction of William F. Thiele, chief engineer and Thomas Utegaard of the engineering department, and George Marcoux, superintendent. Installation of the power equipment will be under the supervision of M. V. Molesberry. The contract for the dikes, however, has been let to the George W. Condon Company, Omaha, Nebr., the concern which built the dikes for the Big Eau Pleine reservoir, which was financed by Consolidated.

Structure To Extend One and One-Third Miles

The dam will be of reinforced concrete, with dikes at each end extending to the shore lines. The total structure will be about one and one-third miles in length, and will require 345,000 cubic yards of earth fill. It will create a lake of about 7,200 acres from which the trees and undergrowth will be removed. About 300 men will be employed.

It will be necessary to relocate one and a half miles of U. S. Highway 51 to place it on higher ground, and the lake, surrounded by woods, will be visible from the highway. The State of Wisconsin is cooperating in the relocation because of the unsatisfactory location in the past, and part of the expense will be defrayed by the Consolidated company. The highway was frequently flooded in the past.

The Knowlton site was formerly owned by the Insull interests and was purchased by Consolidated in 1926 together with other properties in the proposed flowage. The company also owns two other undeveloped power sites, one at Petenwell Rock and the other at Germantown, on the lower Wisconsin River; also a large acreage in the vicinity of the Little Eau Pleine River, where a reservoir was previously contemplated, to be connected with the Wisconsin River by canals. All of these projects were considered for a development program several years ago by the Public Works Administration, but the plans were rejected by Secretary of the Interior Harold L. Ickes.

More Power Planned for Paper Mills

Improved power service to paper mills and converting plants in Menasha, Wis., will result from a $32,000 improvement to be started soon by the Wisconsin Michigan Power Company of Appleton, Wis. Its 33,000-volt high tension line will be rebuilt on higher poles with the new type insulators and hardware. Work will be started as soon as steel towers arrive from the American Bridge Company, which is expected to be in October. The company has three circuits going into Menasha from its generating plant at Appleton, but has been hampered by breaks.

With final approval given by the Wisconsin Public Service Commission and the federal Securities and Exchange Commission, the Wisconsin Michigan Power Company has been sold to the Wisconsin Electric Power Company of Milwaukee, Wis. It was formerly owned by the North American Company, which is subject to the "death penalty" clause for holding companies.

The sale involves a utility plant valued at $26,999,000. Its liabilities include $6,000,000 in common stock at $20 par value per share, $4,000,000 in preferred stock at $100 per share, and $12,500,000 in bonds, due in 1961.

Under the deal, the Wisconsin Electric Power Company acquired from the North American Company all of the outstanding common stocks of the Wisconsin Michigan Power Company and the Wisconsin Gas and Electric Company of Racine, Wis., in exchange for 1,265,000 shares of common stock of the Wisconsin Electric Power Co. issued to the North American Company. The additional shares will bring the total outstanding shares of common stock of Wisconsin Electric Power Company to 2,660,928, of which 167,218 are held by the public.

Fire Damages Finishing Mill

Damage estimated at $5,500 was caused to the Minnesota Mining and Manufacturing Company's plant at Wausau, Wis., Saturday afternoon, August 16 by a fire which broke out in its finishing building. Loss to the building was estimated at $3,000 and to the machinery, $2,500. It was believed that a spark making contact with oil fumes was the cause. The building is of frame construction covered with sheet metal. The building houses the quartz shaker machinery for roofing and sandpaper. The blaze was extinguished within half an hour.

Company workmen had the roof repaired and one machine in operation within eight hours after the fire, and two others were put back into service Sunday afternoon. The company is contemplating rebuilding the structure of fireproof material because of several minor fires.

Program for TAPPI Fall Meeting

Ann Arbor, Mich., September 15-19, 1941

Monday, September 15

Mill visitations at Kalamazoo, Detroit, Ypsilanti, Port Huron.

2:00 P.M.—Registration at Michigan Union and concontinuing through the evening.

6:00 P.M.—Dinner of Fall Meeting Committees at Union.

8:30 P.M.—Movies of Michigan Football Games in Union Ballroom.

Tuesday, September 16

7:30—8:30 A.M.—Breakfast.

8:00 A.M.—Registration at Michigan Union and throughout the day.

9:00 A.M.—General Session—Lecture Hall, Rackham Building.
Chairman—R. A. Hayward, Kalamazoo Vegetable Parchment Company.
Welcome—Ivan C. Crawford—Dean of the College of Engineering, University of Michigan.
Response—W. H. Swanson, President, TAPPI. "The Paper Industry and National Defense" by Clark Everest, Pulp and Paper Industry Advisor to the Office of Production Management.

10:45-11:00 A.M.—Recess.

11:00 A.M.—"International Economics"—Virgil Jordan, Chairman, National Industrial Conference Board.

12:30 P.M.—General Luncheon—Michigan Union.

2:00 P.M.—General Session—Rackham Building.
Chairman—W. K. Kidder, Bryant Paper Company. "Making Best Use of Existing Power Equipment", Ransom S. Hawley, Chairman—Department of Mechanical Engineering, University of Michigan.
"Hybrid Poplars", Phelps Vogelsang—Dow Chemical Company.
"Patents", C. W. Rivise, Patent Attorney.
"The Electron Microscope", "Spectrographic Analysis", E. F. Barker, Chairman. Department of Physics, University of Michigan.

3:30 P.M.—Recreational Period.
Golf, softball, tennis, riding, swimming. Local section competitive teams in golf and soft ball.

4:30 P.M.—Open House at Physics Building.
Inspection and demonstrations of:
Electron Microscope.
Spectrographic Analyses.
Cyclotron.

6:30-8:00 P.M.—Dinner in Michigan Union Ballroom. Guests will be served as tables are filled.
Dancing from 7:00 to 9:00.

9:00 P.M.—"Carnival Night"—Michigan Union Ballroom and Anterooms. Prizes for all. Fifteen games to test your skill. Also dancing, bridge and numerous other diversions.

Wednesday, September 17

7:30-8:30 A.M.—Breakfast.

8:00 A.M.—Registration for new arrivals.

9:00 A.M.—General Session—Lecture Hall, Rackham Building.
Chairman—W. H. Swanson, President, TAPPI.
"The Work of the American Pulp and Paper Association", J. L. Riegel, President, APPA.
"Current Problems of the American Pulp and Paper Association", E. W. Tinker, Executive Secretary, APPA.
"Price Control Policies"—H. F. Taggert, Office of Production Management, and Professor of Accounting, University of Michigan.

10:45 A.M.—Recess.

11:00 A.M.—"Post War Economic Problems"—W. Haber, Professor of Economics, University of Michigan.

12:30 P.M.—Group Luncheon Meetings.

1. *General Interest Meeting*—Michigan League Building, Chairman—Mrs. S. T. Dana.
"Keeping Your Balance"—Dr. O. R. Yoder, Superintendent, Ypsilanti State Hospital.

2. *Fundamental Research*—Michigan Union.
Chairman—H. F. Lewis, Institute of Paper Chemistry.
"Oxidation of Cellulose by NO_2-N_2O_4"—Dr. W. O. Kenyon, Research Laboratories, Eastman Kodak Company.
"Cellulose Cuprammonium System and the Presence of Pectin in Wood Pulp"—T. A. Howells, Institute of Paper Chemistry.
"General Report on Holocellulose Research"—G. J. Hajny and G. J. Ritter, Forest Products Laboratory.
"An Investigation of Spruce Thiolignin"—By Title. G. Edward Ahlm, Institute of Paper Chemistry.

3. *Sizing*—Michigan Union.
Chairman—F. L. Chappell, Jr., Sutherland Paper Company.
"Behavior of Alumina in Relation to Sizing"—B. W. Rowland, H. L. Davis and T. T. Collins, Jr., Institute of Paper Chemistry.
"An Investigation of Rosin Size Precipitation and Its Effect on the Sizing and Strength Properties of Paper"—W. P. Dohne and C. E. Libby, New York State College of Forestry.
"Urea Resins in the Pulp and Paper Industry"—M. H. Bigelow, The Plaskin Company.

"Surface Sizing"—J. P. Strasser, Stein-Hall Manufacturing Company.

4. *Acid Pulping*—Michigan Union.
Chairman—H. A. DuBois, Kimberly-Clark Corporation.
"Pulping Loblolly Pine Heartwood with Calcium Magnesium and Sodium Base Sulphite Liquors"—J. N. McGovern and G. H. Chidester, Forest Products Laboratory.
"Absorption of Sodium Sulphite Liquor by Sweetgum Chips"—J. N. McGovern, J. N. Evert and G. H. Chidester, Forest Products Laboratory.
"Further Studies on the Desulphonation of Calcium Lignosulphonate"—A. J. Bailey, I. A. Pearl, H. K. Benson, University of Washington.

5. *Materials of Construction*—Michigan Union.
Chairman—J. A. Lee, Managing Editor, Chemical and Metalurgical Engineering.
"Priorities" — Colonel G. Brady, OPACS. (Tentative)
"Maintenance Coatings for the Pulp and Paper Industry"—A. R. Olson, Hercules Powder Company.
"Mill Maintenance"—Percy Tigwell, Beloit Iron Works.

3:00 P.M.—Recreational Period.
Intersectional competitive teams in golf and softball.

4:00 P.M.—Open House and Inspection of East and West Engineering Buildings.

6:30-8:00 P.M.—Dinner in Michigan Union Ballroom—Guests will be served as tables are filled. Dancing from 7:00 to 9:00 P.M.

9:00 P.M.—Dramatic Program—"The Service of the Pulp and Paper Industry to National Defense"—Lydia Mendelssohn Theatre, Michigan League Building.

Thursday, September 18

7:30-8:30 A.M.—Breakfast.

9:00 A.M.—General Session—Lecture Hall, Rackham Building.
Chairman—A. H. White, Chairman of Department of Chemical Engineering, University of Michigan.
"Labor Relations"—Samuel L. H. Burk, OPM., formerly Personnel Director, Atlantic Refining Company.

10:45 A.M.—Recess.

11:00 A.M.—"Romance of Research"—W. B. Stout, President, Stout Engineering Laboratories.

12:30 P.M.—Group Luncheon Meetings—All in Michigan Union.

6. *General Interest Meeting.*
Chairman—M. R. Bailey, Bulkley-Dunton Pulp Company.
"Personality in Selling"—Arthur Seccord, University of Michigan.

7. *The Determination of Oxidizable Materials in Pulps (Bleachability), Liquors and Wash Waters.*
Chairman—D. T. Jackson, Hammermill Paper Company.
"The Relation between Bleachability test Data and Other Pulp Characteristics"—T. A. Pascoe and H. E. Nelson, Nekoosa Edwards Paper Company.
"An Improved Chlorine Demand Number"—Dr. H. S. Bristol, International Paper Company.
"The Use of Bleachability Tests in Marketing Pulp"—Rex Vincent, Bulkley-Dunton Pulp Company.
"A Study of Bleachability Methods"—B. L. Browning, Institute of Paper Chemistry.
"Some Observations on Loeschbrandts Method of Determining Oxidizable Materials"—J. C. Tongren, Hammermill Paper Company.
"A Study of Replies from Questionnaires on Operating Control of Pulp Bleaching"—J. D. Rue, Hooker Electrical Chemical Company.

8. *Coating.*
Chairman—W. A. Kirkpatrick, Allied Paper Mills.
"Evaluation of Methocel as an Adhesive for Paper Coatings"—Myron Kin, R. M. Upright, F. C. Peterson, Dow Chemical Company.
"New Adhesive Economics in the Use of Calcium Carbonate"—Howard F. Roderick, Michigan Alkali Company.
"Microscopic Observations of the Bonding Zone of Paper Coatings"—Dr. Curtis R. Singleterry, Research Chemist with Glenn Davidson, Aurora, Illinois.
"Sorbital and Other Polyalcohols in Glue Coatings"—H. C. Speel, Atlas Powder Company.

9. *Biological Control in Paper Making.*
Chairman—Allen Abrams, Marathon Paper Mills.
"Research Work at the Institute of Paper Chemistry on Biological Control"—Dr. J. W. Appling, Institute of Paper Chemistry.
"Experiences in Slime Control in Paper Mills"—J. A. Holmes, National Aluminate Company.
"Identification of Bacteria Found in Papermaking"—Miss Olga Smith, Institute of Paper Chemistry.

10. *Testing Methods.*
Chairman—J. d'A. Clark, Institute of Paper Chemistry.
"A Direct Method of Measuring Surface Roughness of Papers"—M. Heinig, P. K. Baird, Forest Products Laboratory.
"Measurement of the Relative Stiffness in Bending of a Single Fibre"—C. O. Seborg, F. A. Simmonds, Forest Products Laboratory.
"Stain Reactions of Pulps Exposed to Ultraviolet Light"—John Graff, Institute of Paper Chemistry.
"Consistency Tests and Packing Characteristics of Pulp"—A. H. Croup, E. W. Sampson, Hammermill Paper Company.

4:00 P.M.—Recreational Period.
Intersectional competition in golf and softball.

6:30-8:00 P.M.—Dinner in Michigan Union Ballroom—Guests will be served as tables are filled. Dancing from 7:00 to 9:00 P.M.

9:00 P.M.—Theatre Program—Lydia Mendelssohn Theatre, Michigan League Building.
"The Male Animal" Presented by the Kalamazoo Civic Players.

Friday, September 19

7:30-8:30 A.M.—Breakfast.

8:30 A.M.—Busses leave for Ford Motor Company.
Tour of Foundry, Assembly line, Glass plant and Paper mill.

9:00 A.M.—Busses leave for Greenfield Village.
Tour of Ford Industrial Museum.

1:00 P.M.—Luncheon at Ford Plant and Dearborn Inn.

WOMEN'S PROGRAM

Tuesday, September 16

11:00 A.M.—Address in Rackham Lecture Hall.
Speaker—Dr. Virgil Jordan—Chairman, National Industrial Conference Board.
Subject—"International Economics."

12:30 P.M.—Luncheon in Michigan League Ball Room.
Mrs. Alfred H. Lovell, Chairman.
Speaker—Miss Alice Lloyd—Dean of Women, University of Michigan.
Subject—"Youth's Perplexities in 1941."

2:00 P.M.—Meeting held in Amphitheatre in Rackham Building.
Mrs. Charles A. Fisher, Chairman.
Speaker—Miss Olive Dean Hormel, University Extension Service, University of Michigan.
Subject—"A Preview of the New Books."
Speaker—Wesley H. Mauer, Associate Professor of Journalism, University of Michigan.
Subject—"Rare Moments in the Garden". Illustrated with colored pictures.

4:00 P.M.—Informal Tea—In the Garden of the Michigan League Building.
Mrs. Ivan C. Crawford, Chairman.

7:00 P.M.—Dinner and Dancing at the Michigan Union. Fun and Prizes for everyone.

Wednesday, September 17

9:00 A.M. to 11:00 A.M.—Campus Tours, with or without guides.

11:00 A.M.—Address in Rackham Lecture Hall.
Speaker—Dr. William Haber, Professor of Economics, University of Michigan.
Subject—"Post-War Economic Problems."

12:30 P.M.—Luncheon in Michigan League Ball Room.
Mrs. Samuel T. Dana, Chairman.
Speaker—Dr. O. R. Yoder, Superintendent of Ypsilanti State Hospital.
Subject—"Keeping Your Balance".

4:00 P.M.—Reception and Musical Tea in the Assembly Hall, Horace H. Rackham School of Graduate Studies, Mrs. Albert E. White, Chairman.

7:00 P.M.—Dinner and Dancing at the Michigan Union.

9:00 P.M.—Dramatic Program in the Lydia Mendelssohn Theatre, Michigan League Building—"The Service of the Pulp and Paper Industry to National Defense."

Thursday, September 18

9:00 A.M. to 11:00 A.M.—Campus Tours, with or without guides.

11:00 A.M.—Address in Rackham Lecture Hall.
Speaker—William B. Stout, President, Stout Engineering Laboratories.
Subject—"Romance of Research."

12:30 P.M.—Luncheon in Michigan League Ball Room.
Mrs. Edward H. Kraus, Chairman.
Speaker—Mrs. J. K. Pettingill, past National President, Parent Teachers Association.
Subject—"The Family as the Threshold of Our Democracy."

2:30 P.M.—Meeting held in Lecture Hall in Rackham Building, Mrs. Chester Schoeple, Chairman.
Speaker—Dr. Elzada Clover, Instructor in Botany, University of Michigan.
Subject—"A trip down the Colorado River".

7:00 P.M.—Dinner and Dancing at the Michigan Union.

9:00 P.M.—Theatre Production—"The Male Anmal". Presented by the Kalamazoo Civic Players in the Lydia Mendelssohn Theatre, Michigan League Building.

Friday, September 19

9:00 A.M.—Visit to Greenfield Village, Dearborn, Mich.

12:30 P.M.—Luncheon at Dearborn Inn.
Arrangements have been made to take care of all who wish to play golf, bridge or pool, on any of the above days.

Bag Division To Join Union

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., August 25, 1941—About two hundred employees connected with the bag division of the Union Bag and Paper Company held a meeting here this week and voted to organize a union which will be affiliated with the International Brotherhood of Pulp, Sulphite and Paper Mill Workers. The decision to form the organization was taken by more than sixty per cent of those attending the meeting. Much enthusiasm was shown by the workers when it was stated that the employees at the Savannah plant of the concern had recently organized. Among those at the meeting were George C. Brooks, of Fort Edward, auditor of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, Francis J. Tierney, representative of the International organization, and Floyd Van Deusen, president of the Palmer local.

Kennebec Pulp & Paper Co. Makes Unique Chip Handling Installation

For many years, it has been the custom of New England paper mills to store their wood chips in large chip lofts or bunkers, directly above the digesters for intermittent gravity feed, as needed.

Old Practice Expensive

This practice has resulted in expensive construction for digester houses because of the extreme height required for them in order to provide sufficient quantity of bulk storage of chips, which in turn, has required excessively high elevators or long inclined belt galleries to bring the chips from the wood room to the top of the plant.

These large chip lofts or storage bins located in the top of a plant have always been a real fire hazard, making it practically impossible to fight a fire successfully in these chip lofts, in case one occurred. Furthermore, because of the physical nature of wood chips, a difficult problem has always presented itself in discharging the chips from the bottom of such bins to digesters.

A Totally Different Design

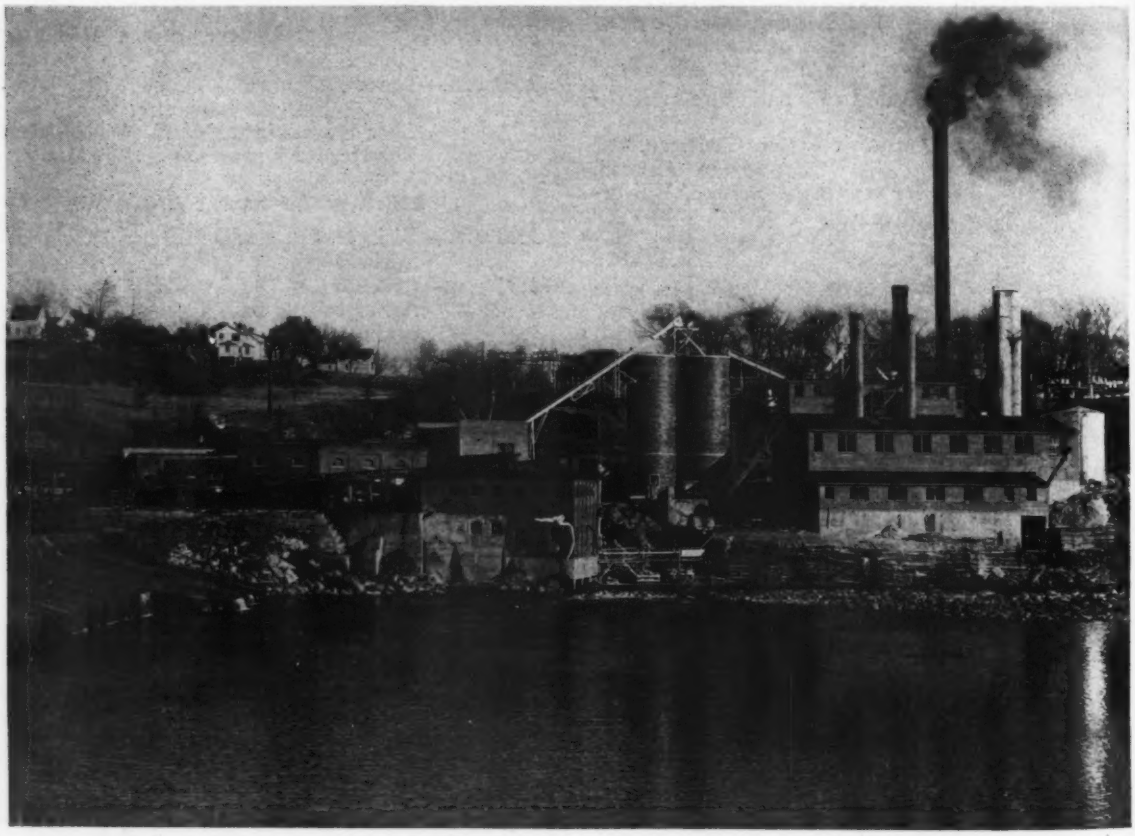
Recently, the Kennebec Pulp and Paper Company plant in Augusta, Me., was destroyed by fire, and this presented an occasion for the Stephens-Adamson Manufacturing Company to overcome these problems by developing a totally different design, which will be clearly understood from the accompanying diagram.

The wood room at this plant operates but eight hours per day, while it is necessary to feed chips to the digesters in large quantities and at a rapid rate at stated intervals over the twenty-four hour per day operating period. Hence, the new design provides for a large cushion storage of chips carried in hollow tile silos resting directly on the ground, providing a most economical means of storing such quantities with a minimum of structures, foundations, conveying machinery, etc.

The chips are carried from the chipper machines and chip screens in the wood room at a rate of 3300 cubic feet per hour through a simple inclined Redler conveyor, to the top of the silos.

This unit operates in totally enclosed steel casings and since Redlers require no intermediate points of greasing, it is unnecessary to have inclined galleries or walkways along side of same. Hence, structurally, economy is obtained here.

The chips feed by gravity to either one of two



Chip Handling and Storage System at Plant of Kennebec Pulp and Paper Co.

THE instant your message to a distant plant or office leaves your teletypewriter, it arrives — a few miles or a few thousand away — exactly as sent, and *in typewritten form.*

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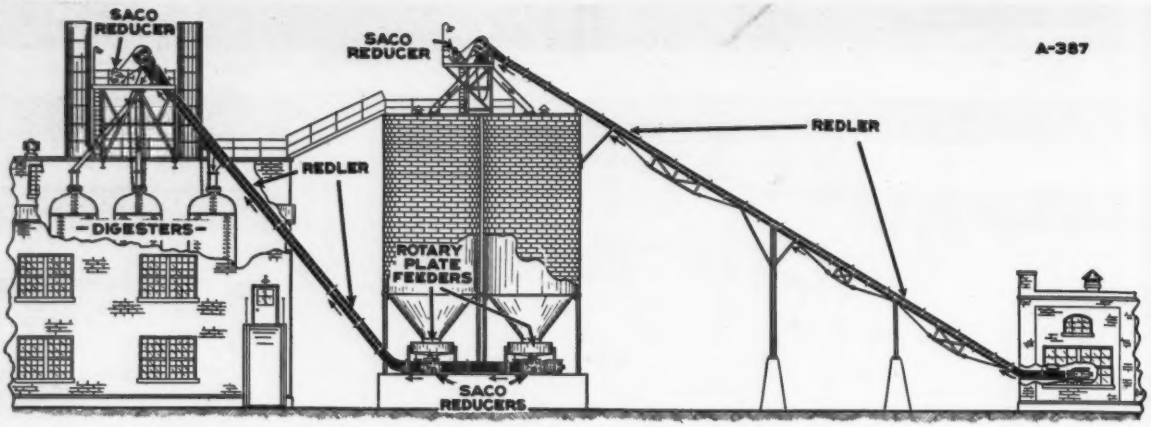
BELL SYSTEM TELETYPEWRITER SERVICE



Cross Section of Chip Handling System at Plant of Kennebec Pulp and Paper Co.

Chips Feed by Gravity

silos, which provides for a 30,000 cubic foot cushion storage. The chips are then withdrawn from these silos as needed and delivered to the various digesters by means of a large inclined Redler unit at a rate of 8880 cubic feet per hour. This 19-inch Redler unit operates at a speed of 130 feet per minute, and makes it possible to charge 5000 cubic feet of chips to a single digester in less than a half hour.

To expedite the problem of withdrawing the chips from the conical bin bottoms of the silos, revolving disc feeders are used, so that a 6-inch diameter adjustable throat opening is provided under each silo cone with adjustable plows to regulate uniformly the flow of chips to the reclaiming Redler conveyor.

Saving in Cost

By this design, a saving was made in the height and cost of the structures for the digester house sufficient to cover the cost of the silo installation, and the silos are divorced from the plant which reduces the fire risk, while the hollow tile type of silo construction prevents freezing of the wood chips in the bins.

The Kennebec Pulp and Paper Company operate a large plant for the manufacture of tissues, paper towels and paper napkins, and this modern method of handling the chip problem has attracted the attention of most of the leading sulphite mills in New England.

F. A. Augsbury Sued for $1,800,000

Malone, N. Y., August 25, 1941—Litigation to recover $1,800,000 damages for breach of contract has been instituted by Benjamin B. Lessen of Syracuse against Frank A. Augsbury, Ogdensburg industrialist.

Represented by Attorney Frederick B. Bryant of Malone, the Syracuse man alleges that he and Mr. Augsbury, owner of the Algonquin Paper Corporation mill at Ogdensburg, had entered into a contract subsequently broken by the defendant, under which Lessen would buy the mill for $1,800,000.

Mr. Lessen, it is alleged, had negotiated with the Ogdensburg man over a period of months to purchase the Algonquin. They agreed on a proposition whereby the buyer should pay $200,000 down and $200,000 a year for eight years. Their negotiations reached their peak on November 8, 1940, according to the complaint, and on the following day, it is charged, Mr. Augsbury notified the prospective purchaser that the deal was off.

It was reported here that Mr. Augsbury desired to remove the shipyard of the St. Lawrence Marine Repair Dock Corporation from the transaction, but Mr. Lessen claimed that it had been included in the agreement and insisted on buying it along with the mill. The shipyard, owned by Mr. Augsbury, adjoins the paper mill property.

The defendant has been given 20 days in which to file an answer. The suit is slated for trial in Onondaga county.

Paper Men Play Golf

[from our regular correspondent]

Philadelphia, Pa., August 25, 1941—The August golf tournament of the Philadelphia Paper and Cordage Association, held at the Old York Country Club last Wednesday, was an event for which the association has long been noted. Thirty-eight players teed off in competition for the Morgan H. Thomas trophy which was placed in competition for the first time. The event was won by R. S. Reed of the Quaker City Paper Company.

The host, Morgan H. Thomas, president of Garrett-Buchanan Co., and the golf chairman, E. L. Richards, local representative of the Buffalo Envelope Company, officiated at the distribution of prizes.

The American Writing Paper Corporation's trophy was put in competition and will be awarded at Pine Valley in October, based on the two lowest net scores in three tournaments. The leaders for this trophy are Morgan H. Thomas who tied with Steve DeFarges.

Among those who participated in the various contests were: Roy Greenleese, Johnson Bronze Company; V. D. Lockman, who captained the Lansdale golf team; A. P. Wilson, Peerless Manufacturing Company; W. J. Culverhouse, Fort Howard Paper Company; J. P. Flury, H. M. Gifford Manufacturing Company; S. C. Brower, J. L. N. Smythe Co.; J. R. Howard, J. R. Howarth Paper Company; Arthur Sherrill, Beveridge Paper Company and C. Wilder, Wilder Brothers.

This tournament was one of the most successful held by the Association and tributes were paid to Morgan H. Thomas, the host, and E. L. Richards, the golf committee chairman. It was decided to hold a similar tournament next August.

With the right Bird Save-All installation you can put a notice like this in the machine room and make it stick . . . A simple, low cost Bird Save-All system takes care of every gallon of white water and puts both stock and water in shape for immediate re-use . . . Let us help you figure how much it will save and at what net return.

BIRD MACHINE COMPANY
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BIRD SAVE-ALL

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 27, 1941—Government Printing Office has received the following bids for 641,000 pounds of white sulphite writing paper in 28 inch rolls: Stanford Paper Company, 7.59 cents; and Marquette Paper Company, 7.47 cents.

For 500,000 pounds of 50% rag, 32 x 42, white manifold paper: Barton, Duer & Koch Paper Company, 19.5 cents; R. P. Andrews Paper Company, 19.95 cents; and Walker Goulard Plehn Company, Inc., 18.45 cents.

For 60,950 pounds of 31 x 44, 50% rag, white antique book paper: Old Dominion Paper Company, 10.477 cents; Whitaker Paper Company, 11.46 cents; and Stanford Paper Company, 14 cents.

For 100,000 sheets of 22 x 28 white railroad board: Barton, Duer & Koch Paper Company, $29.00 per M sheets; Old Dominion Paper Company, $25.648; Bradner Smith & Company, $25.52; Stanford Paper Company, $30.00; and R. P. Andrews Paper Company, $25.80.

For 70,571 pounds of 25% rag, 33 x 48 ledger paper, white, buff and blue: Chicago Paper Company, 14.5 cents, 15.25 cents and 15.25 cents; Mudge Paper Company, 14.5 cents, 15.25 cents and 15.25 cents; Walker Goulard Plehn Company, 11.7 cents, 13.45 cents and 15 cents less 2%; and Old Dominion Paper Company, 13.768 cents, 14.518 cents and 14.518 cents.

Government Paper Awards

Marquette Paper Company has been awarded the contract for furnishing the Government Printing Office with 308,000 pounds of 38 x 48 white offset book paper at 8.7 cents, bids for which were received on August 13. Other paper awards announced by the Government Printing Office include the following.

R. P. Andrews Paper Company will furnish 30,000 sheets of 22 x 28" blue railroad board at $32.33 per M sheets, bids for which were received on August 11.

Mudge Paper Company will furnish 80,000 pounds of 28 x 34 white sulphite writing paper at 9.17 cents. Paper Corp. of U. S. will furnish 133,320 pounds of 24 x 38 H.F. sulphite manila tag board at 6.25 cents, and R. P. Andrews Paper Company will furnish 60,000 pounds of 44 x 64 white coated book paper at 10.25 cents. Bids for these items were received on August 6.

Stanford Paper Company will furnish 100,000 sheets of 22 x 35 white railroad board at $30.50 per M sheets and Cauthorne Paper Company will furnish 49,250 pounds of 38 x 48½ blue mimeograph paper at 7.41 cents. Bids for these items were received on August 4.

Following awards were made for bids received on August 1: Marquette Paper Company will furnish 119,000 pounds of 38 x 48½ white mimeograph paper at 7.1 cents and the same firm will also furnish 355,000 pounds same 32½ x 42½ at 8.1 cents. R. P. Andrews Paper Company will furnish 10,000 sheets, 100% rag, 14 x 8⅞.

Whiting's woven linen azure note paper and 6,000 envelopes for same at $258.50. Barton, Duer & Koch Paper Company will furnish 14,580 pounds of 24 x 38 blue tag board at 9 cents. Same firm will also furnish 75,000 pounds of 23¼ x 26½ ivory colored calendered tag board at 9.5 cents. Marquette Paper Company will furnish 78,390 pounds of 32 x 52½ wood manila paper at 4.75 cents. Same firm will also furnish 69,000 pounds of 38 x 48 light weight M.F. book paper 115 lbs., and 19,400 pounds same 32 x 48, 97 lbs., at 8.58 cents.

Southern California Papermakers Meet

On August 7, Papermakers and Associates of Southern California held their third dinner meeting at the Mona Lisa Cafe, Los Angeles, with 61 present. The meeting was opened by Herman L. Joachim, chairman, who introduced twenty-two new members and nine whose applications are still pending.

The first speaker was William R. Walsh, regional director, National Labor Relations Board who spoke very interestingly on "Labor Relations in Industry."

A Water Symposium was next on the program. Speakers were J. M. Montgomery of Montgomery & Pomeroy, whose subject was "Treatment of Industrial Water Supplies"; M. R. King of Oliver United Filters on "Mechanical Treatment of White Water"; M. W. McAfee of the Dorr Company on "Chemical Treatment of White Water"; and R. C. Sparling of the R. W. Sparling Company on "Metering and Sampling of Water."

The meeting ended with a discussion and question period conducted by Frank H. Wheelock, of Fibreboard Products, Inc.

Among those present were: F. W. Adams, Paul L. Armstrong, Willard G. Axtell, Robert A. Baum, Wm. Belleman, George Boeck, Bruce Brown, Jr., Bruce Brown, Sr., Grover Brown, Richard Buckley, Walter Burroughs, Robert Clarke, Albert Clerx, Charles Clough, V. P. Cole, Robert Cooper, Roy Culp, Frank Dilley, Frank Eggert, A. Eilersgaard, Grant Farmer, Alvin Fink, George Ford, Charles Frampton, Walter Genuit, J. E. Hartford, Alonzo Hatch, J. Henshaw, J. Jamieson, Herman Joachim, William King, M. R. King, William Kinney, Harry Lilburn, Francis Mark, Parke Math, J. E. Maurer, M. W. McAfee, J. M. Montgomery, R. L. Mitchell, Gus Ostenson, Glen Phillips, Richard Pomeroy, David Pye, Lloyd Ramsey, Charles Remine, Foster Rucker, Otto Sass, William Sheehan, Ray Sparling, R. B. Thieme, W. T. Tillotson, Elmer Tolliver, John Van Ounsem, Bruce Wallace, W. R. Walsh, Frank Wheelock, Homer White, Henry Will, Grover Willeforde, and Cal Wood.

Insulating Board Simplified Practice

Printed copies of Simplified Practice Recommendation R179-41 Structural Insulating Board (Vegetable Fiber), are now available, according to an announcement of the Division of Simplified Practice, National Bureau of Standards.

This recommendation concerns not only sizes and thicknesses, but also colors, finishes and treatment of edges for the various insulating board products.

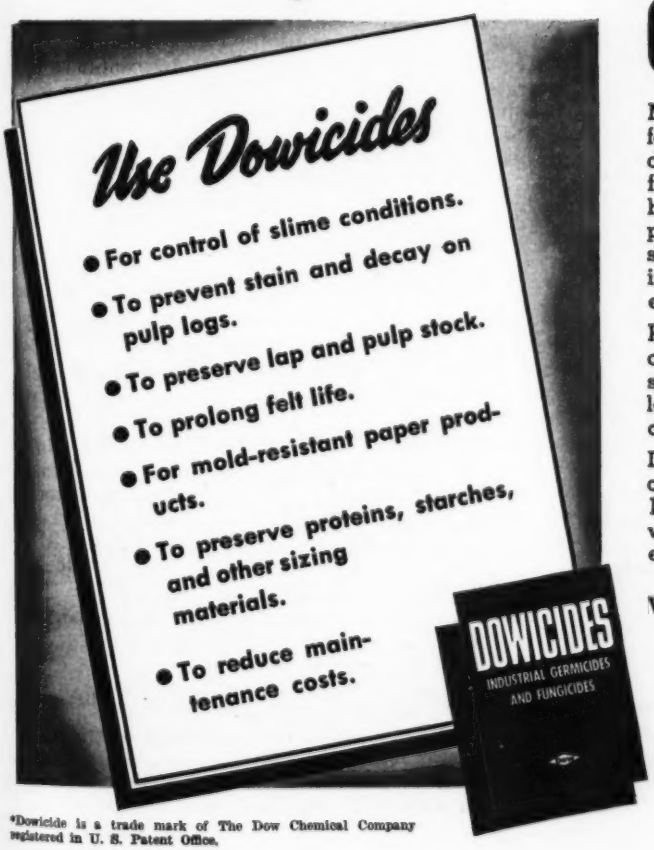
Copies of R179-41 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each. A discount of 25 percent on orders for 100 or more copies is available to those desiring to obtain a supply of this publication for business purposes.

DOWICIDES

Log on right: Treated with DOWICIDES—NO STAIN.

Log on left: Untreated—shows stain and decay.

Prevent STAIN AND ROT ON PULP LOGS!


Use Dowicides
● For control of slime conditions.
● To prevent stain and decay on pulp logs.
● To preserve lap and pulp stock.
● To prolong felt life.
● For mold-resistant paper products.
● To preserve proteins, starches, and other sizing materials.
● To reduce maintenance costs.
DOWICIDES
INDUSTRIAL GERMICIDES AND FUNGICIDES

MILLS CARRYING a considerable supply of pulp logs face the constant threat of losses from stain and decay. Workers in the pulp and paper industry find physical treatment generally unsatisfactory, but the development of a group of chlorinated phenols, known as DOWICIDES*, now provides a simple, effective control for both stain and decay in pulp logs. A number of southern mills report excellent results from DOWICIDE treatments.

Practically all wood is susceptible to attack by organisms which feed on sap and cause a progressive discoloration known as sap stain. Additional losses, due to the action of "dry rot" organisms, often occur while logs are in storage.

DOWICIDES act to prevent stain and reduce loss of cellulosic material. Logs should be dipped in a 1% solution of DOWICIDE G or F—preferably within 24 hours of cutting—since stain cannot be eliminated after it has started.

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Working with you for America

THE DOW CHEMICAL COMPANY
MIDLAND MICHIGAN
New York, Chicago, St. Louis, San Francisco, Seattle, Los Angeles, Houston

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Paper Men Form Metals Committee

Manufacturers of pulp and paper mill machinery and equipment have formed the Paper Industries Metals Committee to cooperate with the OPM and to obtain a preference rating for the materials and equipment essential for the manufacture of pulp and paper. D. C. Everest and C. W. Boyce, consultants of the Pulp and Paper Section of the OPM, and E. W. Tinker, executive secretary of the American Paper and Pulp Association, are cooperating with the Paper Industries Metals Committee.

The initial move to secure a preference rating, according to Mr. Everest, is to compile information concerning the quantity of metals used by the companies supplying equipment to pulp and paper mills. The newly formed committee is now compiling this information for submission to OPM.

The members of the Paper Industries Metals Committee are:

Walter L. Barker, president, Improved Paper Machinery Corporation, Nashua, New Hampshire.

A. B. Clark, president, J. O. Ross Engineering Corporation, New York City.

W. W. Cronkhite, manager, sales, Industries Manufacturers Section, General Electric Company, Schenectady, N. Y.

Frank R. Henry, vice-president, Simonds Worden White Company, Dayton, Ohio.

Ralph S. Johnston, director of sales, Pusey & Jones Corporation, Wilmington, Del.

S. Harley Jones, vice-president, E. D. Jones & Sons Company, Pittsfield, Mass.

Herman L. Kutter, president, The Black-Clawson Company, Hamilton, Ohio.

L. J. List, president, Samuel M. Langston Company, Camden, N. J.

Homer D. Martindale, vice-president, Shartle Brothers Machine Company, Middletown, Ohio.

Elbert H. Neese, president, Beloit Iron Works, Beloit, Wis.

William B. Wilshusen, president, Cameron Machine Company, Brooklyn, New York.

Phillips Dennett, president, Bird Machine Company, South Walpole, Mass., chairman.

John Cornell, *Paper Mill News*, New York City, secretary.

OPM Industry Chief to Speak

Norbert A. McKenna, recently appointed chief of the Pulp and Paper Section in the Office of Production Management has accepted an invitation to address the opening session of the National Paper Trade Association at the Stevens Hotel, Chicago, in the afternoon of Monday, September 15.

In recognition of this opportunity to receive advice and information as to policies from an authoritative source, it is announced that the session will be an Open Industry Meeting to which manufacturers and their representatives will be invited. All members of the trade will also be welcome whether members of the association or not.

Another speaker at the same Open Industry Session will be Walter C. Shorter, assistant to the Director of Purchases of OPM, whose wide experience and intimate knowledge of the Industry has been devoted to the requirements of the Procurement Division for many months. Mr. Shorter will discuss the needs and problems met with in obtaining paper supplies for the various Governmental Departments.

Affiliate With N.P.T.A.

On August 12 the Chicago Paper Association voted unanimously to affiliate with the National Paper Trade Association. This affiliation brings once again representative merchants in the Wrapping Paper field from the second largest market in the United States into National membership. Officers of the Chicago Paper Association are as follows: President, Mr. Samuel S. Weil, of Joseph Weil & Sons, Inc.; Vice President, Robert Levinson, of Eagle Wrapping Products Company; Secretary-Treasurer, Robert E. Knox, of Knox & Schneider.

The new members of the National Association are as follows: Chippewa-Arrow Paper Company; Commercial Paper and Bag Company; J. Chukerman & Sons; Eagle Wrapping Products Company; Hanchett Paper Company; Hollis & Duncan; Ideal Wrapping Products, Inc.; Inlander-Steindler Paper Company; Inlander Brothers; Knox & Schneider; Levin Brothers Paper Company; Lubin Brothers Paper Company; Peerless Paper Company; Pilcher-Hamilton Company; Randolph Paper and Bag Co.; Rauth Brothers; Fred Rentz Paper Company; Joseph Weil & Sons, Inc.; Western Bag and Paper Company; Fried & Bell Paper Company; Schwarz Paper Company; Koehler Paper Company and Beier & Co.

Schmidt & Ault Buy Mill

The Schmidt & Ault Paper Company, of York, Pa., announces the purchase, from the York Paper Manufacturing Company, Inc., of its Princess street property, which contains a Cylinder machine, trimming 72 inches. This mill has been idle for a great number of years. The Schmidt & Ault Paper Company has not yet announced its plans for this acquisition.

The Schmidt & Ault Paper Company continues to operate its own property, containing one Cylinder and two Fourdrinier machines, at full capacity.

The York Paper Manufacturing Company continues to operate its second mill, located at Rockburn, just outside the city of York, which contains a 54 inch, three-Cylinder machine, trimming 36 inches, manufacturing sheathing and building papers.

Florida Mill Starts Operation

J. H. Allen, president of the Florida Paper and Pulp Company, Pensacola, Fla., announced last week that the first stock run of the mill had been successful and the paper machine had been in operation all night without a break.

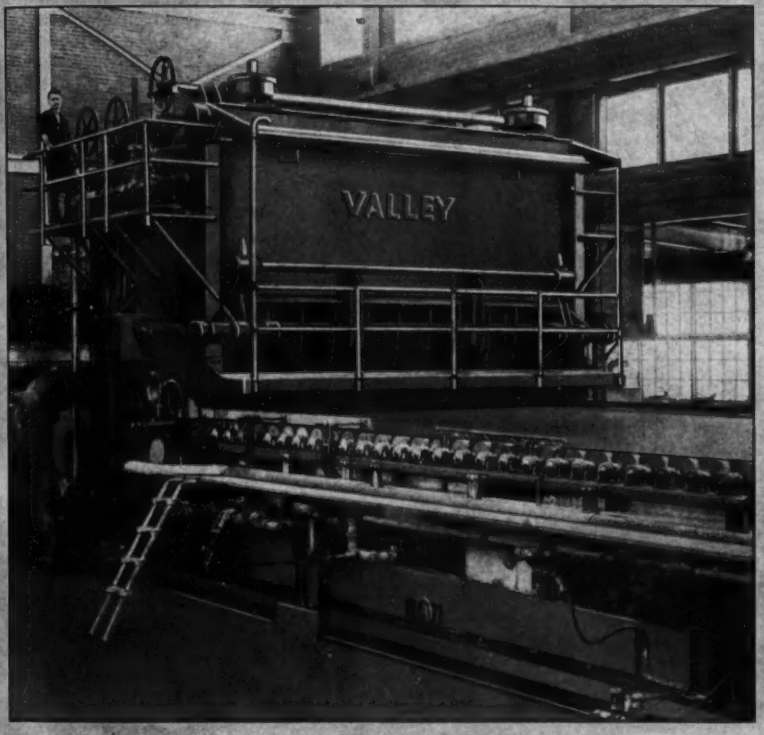
Mr. Allen said that he expected to get into full operation during the current week. He also said that a new world record of 9 minutes in delivering stock from the gate on the head box to the reel, was established by E. H. Mayo, operating consultant. Mr. Mayo's former record was 15 minutes, made at Savannah, Ga.

Formal opening ceremonies of the mill are planned for October 10.

Cleveland Container Gets Big Order

The War Department at Washington awarded a $232,807 contract to the Cleveland Container Company, 10630 Berea Road, Cleveland, Ohio, for fiber containers for artillery ammunition.

Your Surest Guarantee Of PERFECT FORMATION



INLETS and HEAD BOXES

by Valley

214" INLET AND HEAD BOX INSTALLED AT CHAMPION PAPER AND FIBRE CO., PASADENA, TEXAS

VALLEY

Iron Works Company

Plant: Appleton, Wisconsin

Eastern Representative:
Harry Bennett, 12 McKinley St.
Bronxville, Westchester Co., N. Y.

Canadian Agents:
Pulp & Paper Mill Acc., Ltd.
Dominion Square Building,
Montreal, Quebec, Canada

Our success in handling so many difficult problems of stock entrance (like running 10 pound tissue to 230 pound board on the same machine) has induced a confidence that is rapidly pervading the Industry.

This confidence is impressively illustrated by the volume of *repeat* orders being executed.

It is more impressively evidenced by the number of *new* Paper Machines being installed with "Head Box and Inlet by Valley," *specified* by the purchaser.

Our experience in putting stock onto paper machines covers approximately 400 installations. Our resources for supplying your exact requirements are unexcelled.

Let us improve your stock entrance equipment. Write us today.

Slices and Head Boxes • Screw Presses • Micro-Mist Spray Dampeners • Laboratory Equipment
Pulp Washing Systems • High-Speed Beaters • Breaker Beaters • Vortex Beaters • Plug Valves
Sutherland Refiners • Flat and Rotary Screens • Thickeners • Deckers • Paper Markers • Roll-Headers

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending August 27, 1941

	High	Low	Last
A. P. W.	1½	1½	1½
Armstrong Cork Co.	28¾	28½	28¾
Celotex Corp.	8⅞	8¾	8¾
Celotex Corp., pf.	67⅝	67	67⅝
Certain-Teed Products Corp.	3½	3¼	3½
Certain-Teed Products Corp., pf.	33½	31	33
Champion Paper & Fibre Co.	21½	21½	21½
Champion Paper & Fibre Co., pf.	105	104¾	105
Congoleum-Nairn Co.	18½	17¾	18½
Container Corp. of America	15½	15	15½
Continental-Diamond Fibre Co.	9⅜	9	9⅜
Crown-Zellerbach Co.	14	13¼	14
Crown-Zellerbach Co., pf.	88	87¾	87¾
Flintkote Co.	14½	14⅛	14½
Robert Gair	2⅛	2	2
Robert Gair, pf.	10¼	10⅛	10¼
International Paper & Power Co.	18⅜	17½	18¾
International Paper & Power Co., pf.	69¾	67½	69¾
Johns-Manville Corp.	67¼	66¼	67
Johns-Manville Corp., pf.	122½	122½	122½
Kimberly-Clark Corp.	30¼	30	30
MacAndrews & Forbes	26	25½	26
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	24⅞	22½	24⅞
Mead Corp.	9⅛	8½	9
Mead Corp., pf.	71	70½	70½
Paraffine Companies, Inc.	31	31	31
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	15¾	15½	15½
Rayonier, Inc., pf.	28	28	28
Ruberoid Co.	18¼	17¾	18¼
Scott Paper Co.	38¼	37¼	38¼
Scott Paper Co., pf.	110¾	110¾	110¾
Sutherland Paper Co.	20½	20⅛	20½
Union Bag & Paper Corp.	11	10¾	11
United Paperboard Co.	3⅞	3⅞	3⅞
U. S. Gypsum Co.	59½	58	59
U. S. Gypsum Co., pf.	178½	178½	178½
West Virginia Pulp & Paper Co.	19	18½	18¾

New York Curb Exchange

High, Low and Last for Week Ending August 27, 1941

	High	Low	Last
American Box Board Co.	5⅛	5⅛	5⅛
Brown Co., pf.	22½	22	22½
Great Northern Paper Co.	39½	39¼	39¼
Hummel-Ross Fibre Corp.	6½	6½	6½
National Container Corp.	10¾	10¼	10⅜
St. Regis Paper Co.	2⅜	2⅛	2¼
St. Regis Paper Co., pf.	110¾	110½	110⅝
Taggart Corp.	2⅜	2⅜	2⅜

Abitibi Earnings Improve

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 25, 1941—Earnings of the Abitibi Power and Paper Company for July, 1941, prior to audit, charges for depreciation, bond interest of $296,640.95 (includes interest on overdue and unpaid interest) and income and excess profits taxes, amounted to $775,151.68, as compared with $941,390 in July, 1940, and $718,109 in June, 1941, G. T. Clarkson, receiver and general manager of the company reports.

Included in the above earnings for July 1941, is $157,719.13 received as premium on United States exchange. Bond interest of $296,640.95 for such month is exclusive of the premium which would require to have been provided to permit payment of such interest to be made in United States funds, as may be required.

Shipments of newsprint in July 1941, amounted to 36,825 tons, as compared with 46,168 tons in July 1940, and 35,384 tons in June 1941. Present indications are that shipments of newsprint will be about 38,500 tons in August 1941, as compared with 38,655 tons in August 1940.

Shipments of sulphite pulps amounted to 8,144 tons in July 1941, as compared with 7,472 tons in July 1940, and 7,220 tons in June 1941. Present indications are that shipments of sulphite pulps will amount to about 9,000 tons in August 1941, as compared with 7,133 tons in August 1940.

If these estimates are realized, the good profit margin on sulphite pulp sales may lift profits above the 1940 level for the first time since April. The pulp estimate, indicating a sharp increase over last year, is in line with the continuance of the improvement in export sales of Canadian pulp producers this year.

Paraffine Cos. Earn $3.16

Net profits for The Paraffine Companies, Inc., for the fiscal year ended June 30 were $1,600,038, as compared to $1,713,020 last year, according to the company's annual statement, just released. Provision for $203,135 reserve against the Japanese subsidiary was a factor in the apparent decline of profits.

Earnings on the common stock, after provision for preferred dividends, amounted to $3.16 a share compared with $3.40 in the 1940 fiscal year.

President W. H. Lowe said the company had no excess profits tax under the amended 1940 revenue act.

Pabco's part in the national defense program was discussed briefly in Lowe's message to stockholders. He said:

"The national defense program is now a major factor in industrial operations. The Company is making a substantial contribution to this program. Many of the Company's products are used directly in the production of defense materials such as naval craft and army cantonments and also indirectly in the expansion and maintenance of that vast industrial and housing activity that is required to equip and maintain our expanding forces."

Masonite Files with SEC

The Masonite Corporation, of Wausau, Wis., and Chicago, Ill., has filed with the Securities and Exchange Commission in Washington a registration statement covering a proposed new issue of 35,000 shares of 4½% cumulative preferred stock, par value $100.

Proceeds will be used to redeem 18,419 shares of 5% cumulative preferred stock now outstanding, and to reimburse the corporation's treasury for expenditures in connection with an improvement program now under way at its plant at Laurel, Miss. The remainder of the proceeds would be added to the company's working capital.

Continental-Diamond Profits Up

The Continental-Diamond Fibre Company and wholly owned domestic subsidiaries for the six months to June 30, reports a net income of $358,685, after $575,000 provision for Federal income taxes and $50,000 provision for contingencies, compared with net income of $220,070 after $84,000 Federal income taxes last year, when no provision for contingencies was made. Profit before Federal taxes on income was $983,685, compared with $304,070. Sales totaled $5,254,986, against $2,985,130.

Chicago Prices Set

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 27, 1941—Individual agreements whereby 30 manufacturing companies in the Chicago area, all large consumers of wastepaper, will keep their bids for the four low grades of wastepaper within the "Chicago" prices of June 16, 1941, has been announced by the Office of Price Administration and Civilian Supply.

The June 16 "Chicago" prices ($13 per ton for No. 1 mixed; $14 per ton for super-mixed; $15 per ton for news, and $16 per ton for corrugated) are those agreed upon previously by OPACS and individual dealers in wastepaper.

The 30 manufacturers also have agreed that they will allow brokers or dealers already under contract to them to sell wastepaper to such other mills as are in distress for supplies upon determination of such need by OPACS.

This diversion will only be requested in event of an emergency and will continue only for a short period. As a further condition, it was understood that OPACS determine with the company thus making supplies available that a surplus inventory is adequate.

In reference to the "Chicago" wastepaper prices, it is pointed out that the agreements with wastepaper dealers permit an additional charge of $1 per ton for loading corrugated paper in freight cars in the city of Chicago only.

This differential has not been in effect in other cities in the Chicago area. No other differentials will be recognized and the distinctions among various grades will be carefully observed, according to the agreements.

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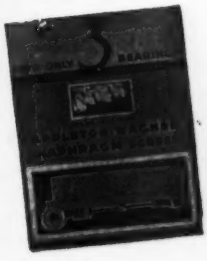
Check the design and construction features of Appleton Paper Making Equipment. You'll find many new developments and refinements that not only speed up production, but also reduce labor and operating costs. This means faster and more profitable paper making now, and Appleton construction means steady, dependable and efficient production for years to come.



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☐ APPLETON VORTEX BEATER
☐ ROBERTS PULPWOOD GRINDER

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Come To Terms With Taggart Corp.

OSWEGO, N. Y., August 25, 1941—Announcement is made here that negotiations between the Taggart Corporation and members of the Machinists and Electrical Workers organization have been completed following several weeks of arguments. A decision relative to a new working contract was reached this week at a conference between T. Wenzel, labor relations representative of the Taggart Corporation, and representatives of the employees. William Gorman, president of the Machinists organization, and Jerome Winterhalt, head of the Electrical body, participated in the conference at which a contract satisfactory to both sides was signed. The terms of the working agreement, which will be retroactive to May 1, 1941, were not divulged. It will be in effect to next May 1. Several weeks ago at a joint conference proposals were submitted to the four crafts having membership in the paper mill. Recently, those employees affiliated with the Papermakers and Pulp and Sulphite organizations signed the agreement and the action taken this week by the other organizations concludes the negotiations on grounds of mutual satisfaction.

Status of International Paper

WASHINGTON, D. C., August 25, 1941—The Securities and Exchange Commission ruled today that International Paper Company is not an electric utility company and thus subject to regulation under the Holding Company Act.

CONSTRUCTION NEWS

Hamilton, Ohio—Champion Paper and Fibre Company, North B street, manufacturer of coated and uncoated paper stocks, bond and other papers, has approved plans for new addition to mill, consisting of a one-story structure, about 50 x 112 feet, to be used for general mill expansion. Cost reported over $50,000, with equipment. General erection contract has been awarded to F. K. Vaughn, First National Bank Building, Hamilton, and superstructure will proceed at once.

Menasha, Wis.—The Gilbert Paper Company, manufacturer of bond, ledger and other writing papers, has completed plans for new one-story addition, to be used primarily for storage and distribution. No estimate of cost has been announced. General construction award has been made to C. R. Meyer Son Company, 50 State street, Oshkosh, Wis., and work is scheduled to be placed under way at once.

Los Angeles, Calif.—The Pioneer-Flintkote Company, Alameda and 55th streets, manufacturer of roofing papers and other kindred stocks, box board, etc., has filed plans for two new additions to mill, each one-story, to be used for a tank and storage building, and for office and general operating service, respectively. No estimate of cost announced. Work will be carried out by day labor and will be placed under way at once. Company is a subsidiary of the Flintkote Company, 30 Rockefeller Plaza, New York, N. Y.

Vancouver, Wash.—The Columbia River Paper Mills, Inc., manufacturer of writing and other paper stocks, newsprint, etc., has work under way on new one-story addition to mill, previously referred to in these columns, to be equipped with new paper-making machine and auxiliary apparatus for expansion in output. Cost is reported close to $100,000, with equipment. Completion is scheduled in the fall.

Chelsea, Mich.—The Central Fibre Products Company, fiber specialties, has approved plans for new one-story building, about 50 x 135 feet, for storage and distribution, and will begin superstructure at once. Cost estimated about $35,000, with equipment.

Holyoke, Mass.—The Chemical Paper Manufacturing Company, Jackson street, manufacturer of writing and other paper stocks, box board, etc., has taken out a permit to install new hoisting facilities at mill, and will carry out work with company forces.

Oklahoma City, Okla.—The Oklahoma Paper Company, 301-309 East California street, commercial paper stocks, has arranged for a merger with the Globe Envelope Company, 1741 N.W. Fifth street, manufacturer of commercial envelopes and kindred paper goods. Both companies will continue operations as heretofore under a single management, and the two plants, including converting works, will be maintained, with expansion in general operations.

Perth Amboy, N. J.—The Philip Carey Manufacturing Company, Cincinnati, Ohio, manufacturer of roofing papers, asbestos paper board products, etc., is beginning occupancy of former plant of the Pardee Tile Works, Inc., South street, Perth Amboy, recently purchased, as previously noted in these columns, and is carrying out modernization and improvements. Machinery previously used for tile manufacture has been removed, and new equipment will be installed for the manufacture of various paper products and allied specialties of the purchasing company. It is expected to have the mill ready for production in near future. The plant approximates about 200,000 square feet of floor space, and will be equipped for large production. Company has contracted with the Public Service Electric & Gas Company for electric power supply for mill service.

Muskegon, Mich.—The Central Paper Company, Inc., manufacturer of kraft, crepe, tissue and other paper stocks, has work under way on rebuilding and modernizing the former local plant of the Chase-Hackley Piano Company, acquired early this year for expansion, as noted in these columns at that time, and will carry out program over a period of months. Company also is installing additional equipment in present mill, to provide for increased production. Program is estimated to cost in excess of $100,000, with machinery.

Cleveland, Ohio—The Dobeckmun Company, 3301 Monroe street, manufacturer of cellophane products, has leased space in local building of the Cleveland Corrugated Box Company at Wentworth avenue, S.W., and West Seventy-first street, totaling about 35,000 square feet of floor area, and will use for extensions in storage and distribution facilities. A similar branch in building at 1378 West Seventy-eighth street, will be removed to new location, where increased space will be provided.

Buffalo, N. Y.—The Buffalo Envelope Company, 270 Michigan avenue, manufacturer of commercial envelopes and kindred products, has filed plans for new one-story building on Carroll street, to be used for storage and distributing service. Cost reported close to $18,000, with equipment. Work will be placed under way at once.

Wausaw, Wis.—The Minnesota Mining and Manufacturing Company, 900 Fauquier street, St. Paul, Minn., manufacturer of sand paper and other abrasive paper stocks, is planning rebuilding of one-story structure at raw material plant at Wausaw, recently destroyed by fire. No estimate of loss has been announced.

Laurel, Miss.—The Masonite Corporation, manufacturer of insulating and other wood pulp board products, has arranged for the sale of preferred stock to total about $3,675,000, of which approximately $1,775,000 will be used for expansion and additions to working capital. Company has work under way on a number of extensions in mill, previously referred to in these columns, including a new multi-story addition to die stock mill, extensions in insulating board plant, electric power plant, and other work. The power station is being completed and is scheduled for immediate service; it will have a capacity of 13,500-kw., providing for sufficient excess over present mill requirements.

Demand Less Brisk

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., August 25, 1941—Whatever the cause, consumer demand in the paper trade in this area eased off slightly last week. There yet is sufficient volume to satisfy the jobbing and manufacturing trade and to assimilate about all the materials they can get together. Some are inclined to believe that action on the part of the Government to restrict rising prices has led to more confidence on the part of consumers and therefore they are not so anxious to get into the market lest higher prices are in effect when they actually need materials.

Paper converters, however, showed no particular inclination to curtail their production. For one thing, their warehouse reserves are in a bad way and, even if demand falls off materially, they will keep in active production until these reserves have been built up.

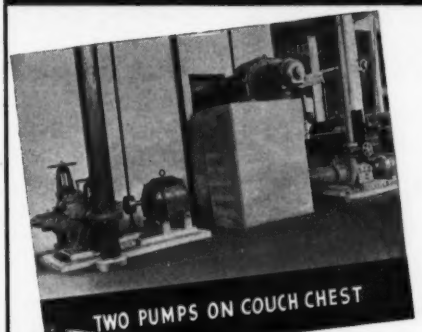
Box and container demand, for the most part, held steady last week with perhaps a slight decline. Demand from the dairy and ice cream trade for waxed containers of all kinds continued heavy. Business in this line is expected to continue until well into next month. Due to heavy demand through the summer, the consumers have built up no reserves and if warm weather continues, business should continue until cold weather. Paper specialties also moved well last week in preparation for the long Labor Day holiday, which will start Friday and continue until the following Tuesday. Tissues also were moving well.

Demand for building paper and roofing held up the last week with the early fall season getting under way. Volume is considerably ahead of last year and likely will remain so during the remainder of the year. In many cities the volume for this material will reach an all-time high.

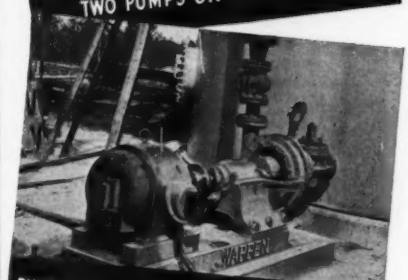
Fine paper demand held good with prices firm to strong. Larger printers have much work in their shops and more in prospect.

The paper stock market showed no change. A good demand continues for all grades of paper, particularly those to be converted to roofing and building grades. The rag market was strong with higher grade materials being particularly wanted.

ANOTHER SOUTHERN MILL GOES WARREN!



TWO PUMPS ON COUCH CHEST



PUMP FOR WEAK LIQUOR TO RECOVERY ROOM

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Newly opened Florida Pulp and Paper Company plant at Pensacola.

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Green Liquor
Bleached Liquor
Stock—thick and thin
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For low pumping costs today and tomorrow, write Warren into your pump specifications.

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WARREN, MASSACHUSETTS

Government Rejects Some Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 27, 1941—Reports current here are to the effect that due to the chlorine shortage some paper is being rejected by the Government Printing Office.

Attention of members of Congress is being called to this. Just what, if anything will be done, cannot be learned at this time. Government Printing Office officials are cognizant of the chlorine situation and action taken by OPM but apparently they are of the opinion that contractors have to live up to their specifications. It is putting some paper contractors between the devil and the deep blue sea.

There is nothing official being done about the matter at this time but sooner or later there is bound to be some clarification.

PAPER TRADE JOURNAL

Title Reg. U. S Pat. Off.

Henry J. Berger

EDITOR

Vol. 113 August 28, 1941 No. 9

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Ann Arbor, Mich., September 16-19.

NATIONAL PAPER TRADE ASSOCIATION, annual Fall Meeting, Stevens Hotel, Chicago, Ill. September 15-17.

LABOR DISPUTES

The millions of man hours lost and the slowing down of defense work by strikes represents a substantial loss to the nation. In the week ended August 16, the total number of strikes increased to 42, of which 28 involved CIO unions and 14 AFL unions. The situation today is considered more serious by defense officials than on last June when differences between management and labor unions closed many key plants whose output is vital to defense.

In a statement issued on August 13 by the National Association of Manufacturers, a complication of the loss by strikes in defense and in non-defense industries reveals the irreparable loss caused by strikes. "In the five weeks before the invasion of Russia by Germany, 960 man days were lost because of strikes in defense industries. In the five weeks after the invasion of Russia by Germany 554 man days were lost because of strikes in defense industries; a reduction of 42%. On the other hand, in the five weeks before the invasion of Russia by Germany, 2,171,000 man days were lost because of strikes in non-defense industries. This compares with 2,467,000 man days lost in the five weeks after the invasion of Russia; an increase of approximately 14%."

In commenting on the inadequacy of federal machinery to reduce industrial disputes, the association points out that, "It is significant that many of these labor walkouts have not been brought about by demands for higher wages, shorter hours or better working conditions. They stem, rather, from the attempts of labor unions to gain more power in the absence of a labor law which would grant to both workmen and management equal reponsibilities as well as rights. Such strikes have even been called by unsuccessful unions in defiance of adverse labor board votes, thus representing an effort by a willful minority to promote labor-power politics. These recent strikes have even occurred in flagrant violation of agreements entered into by management and labor, approved by heads of three governmental agencies in which a two-year moratorium on strikes was subscribed to by all parties."

Referring to the shipyard strike which was temporarily settled by President Roosevelt's order for the Navy to take over and run the plant, which reopened on August 25, the association's statement said that, "At Kearny, N. J., for example, union members in the Federal Shipbuilding and Drydock Company struck despite a signed obligation outlawing both walkouts and lockouts until June 23, 1943. Less than sixty days ago this union signed one agreement, with these federal agencies as mediator, only to ignore that contractural arrangement; which was supposedly binding on both labor and management, by an appeal to another federal labor agency. Despite the two-year agreement, which included 12% wage increases for workers, the union still sought a form of closed shop, and violated its agreement in order to enforce its demands."

The seriousness of the situation when labor fails to live up to its contractural responsibilities is cited by the association in part as follows: "This strike at the Kearny shipyard is not just another episode in the history of industrial disputes; it is a classic illustration of the strike-madness which is sweeping the nation; it focuses the attention of the whole people upon the basic underlying structure of our labor law as it affects the right to work. And, before this country witnesses once again a return of that inviolable right to every workman, union member or not, a new bill of rights for American industry, workmen and management, must be written. No labor dispute can be solved by government seizure; this is merely sponging a leak which some day may become a flood. The Administration and the Congress must face today the fact that nearly 4,400,000 man days of defense work irretrievably lost during the first seven months of 1941, worth an estimated $29,480,000 in defense production, will be repeated again and again unless the responsibilities of labor are as firmly established under law as are those of management.

If the government of this country seeks to preserve fundamental American principles, it cannot tolerate a national labor policy which will permit the continuance of tremendous losses of vital defense production because of labor union irresponsibility.

The basic issue of the Kearny shipyard strike was the rejection by the company of the National Defense Mediation Board's recommendation of "maintenance of membership" or the closed shop. In a statement early this month L. H. Korndorff, president of the Federal Shipbuilding and Drydock Company, a sub-

sidiary of the United States Steel Corporation, said in part: "We do not believe that it is the policy of the United States that no one shall work at Federal Shipbuilding in the construction of destroyers, cruisers, and cargo ships for the Government unless, having once become a CIO union man, he shall continue to be a CIO union member; if it is, then Congress should so declare. The company itself will not, by voluntary agreement with the union, be a part to or establish such a policy."

That the Administration has aided union campaigns for the closed-shop through the Mediation Board, is reflected in case of the Bethlehem Shipbuilding Corporation which was forced to accept a closed-shop agreement with the AFL unions, and again by North American Aviation, which was forced by the Board to require any employee who joined a CIO union to remain a member of that union "as a condition of continuing employment." A recent ruling by the highest court in New York State held that employees whose union has made a valid closed-shop contract with their employer may not choose another union as their bargaining representative and thus repudiate the contract before its expiration date. In this ruling, the State court held that New York's own labor act, known as the "Little Wagner Act", does not authorize the State Labor Board to upset a contractual relationship or to order an employer to deal with another union, even though an election may have shown that a majority of the employees prefer the new union.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1941		Corresponding Weeks, 1940	
July 12	97.4	July 13	91.1
July 19	100.4	July 20	91.3
July 26	101.9	July 27	87.6
August 2	100.7	August 3	87.4
August 9	102.3	August 10	87.9
August 16 (Prelim.)	*101.1*	August 17	84.6

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1940	89.1	84.7	82.3	84.3	90.0	92.1	85.3
1941	85.6	89.7	92.3	96.4	98.9	99.5	*95.0*

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1940	85.1	81.5	85.5	84.9	80.9	85.6
1941	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941
Year to Date	68.4	77.9	87.3	68.5	78.7	86.9	*94.2*
Year Average	69.9	80.4	79.8	71.5	83.4	85.6	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	62	67	67	70	69	70	69	75	78	82	80	74	72
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	72	74	72	79	77	71	73
1941	75	81	82	83	84	88	*86*	..	..	..	..	..	..

Week ending July 12, 1941—77
Week ending July 19, 1941—92
Week ending July 26, 1941—92
Week ending Aug. 2, 1941—93
Week ending Aug. 9, 1941—91
Week ending Aug. 16, 1941—92

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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SOUTH AMERICA
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LYDDON
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(AMERICA) INC.

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The *S. S. Conneaut* discharges a load of coal at the Wyandotte docks of the Michigan Alkali Company. Beyond are the piles of limestone, also delivered by the Company's fleet from its own Michigan quarries.

• It's 6:26 A. M. and the S. S. Conneaut is docking at Wyandotte, just in from a Lake Erie coal port. Five thousand, eight hundred tons of coal are heaped in the hold. She is riding low in the water. . . . It's boom time — for one of the largest booms on the Great Lakes.

The big boom swings into action. The coal begins to move. A steady jet-black stream of it. Sixteen tons a minute. In six hours the coal is on the pile, the cargo hold is empty, the captain is on the bridge, they are casting off the lines.

Coal from the Company's own mines, brought to Michigan Alkali's plants by its own fleet of ships, is a vital part of the process whereby salt and limestone are combined to produce alkalies. Every ship-load of coal that is poured out on the banks of the Detroit River means that several train-loads of Wyandotte chemicals are going out across the nation. And the ease and efficiency with which Michigan Alkali raw materials are handled mean faster service, better chemical products for you.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Microbiological Problems Related to Water

By Attmore E. Griffin[1]

Abstract

The process in water purification, known as break-point chlorination, although utilized at first for taste and odor control provides additional benefits in bleaching effects on color, improved floc formation, savings in alum requirements, savings in wash water, longer filter runs, iron and manganese removal, increased stability of sludge, chlorine demand stabilzation, together with step-ups in sterilization.

Break-point chlorination is an amplification or extension of superchlorination (*see* Fig. 1). Whereas superchlorination seldom signifies more than the addition of a large amount of chlorine, break-point chlorination signifies a type of controlled chlorination based upon a laboratory study of the water in question. For instance, the extent to which the break-point reactions will go—i. e., the magnitude of the "hump" and "dip" in the break-point curve, depends to a great extent upon the final pH of the water under treatment. This is shown in Fig. 2, where the residuals resulting from the treatment of distilled water containing 0.50 p.p.m. NH_3-N at pH 5.0, 6.0, 7.0, 8.0 and 9.0, with various amounts of chlorine up to 11 p.p.m. have been plotted. These data indicates that for a 2-hour period of contact the optimum pH should center around 7 and 8. Plant practice indicates that this pH range may be extended to include pH 6.5 and 8.5. Repeated plottings of this sort

[1] Member TAPPI, Assistant Director, Technical Service Division, Wallace & Tiernan Co., Newark, N. J.

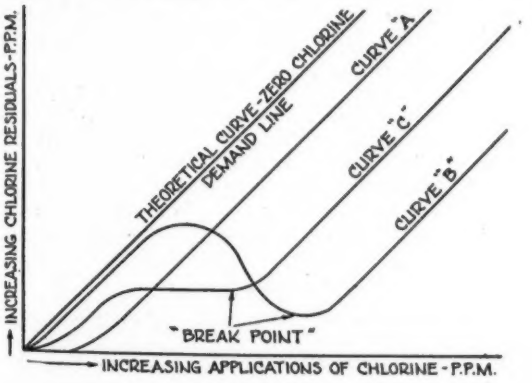

FIG. 1

Typical Chlorine Residual Curves Obtained when Water Is Treated with Increasing Amounts of Chlorine

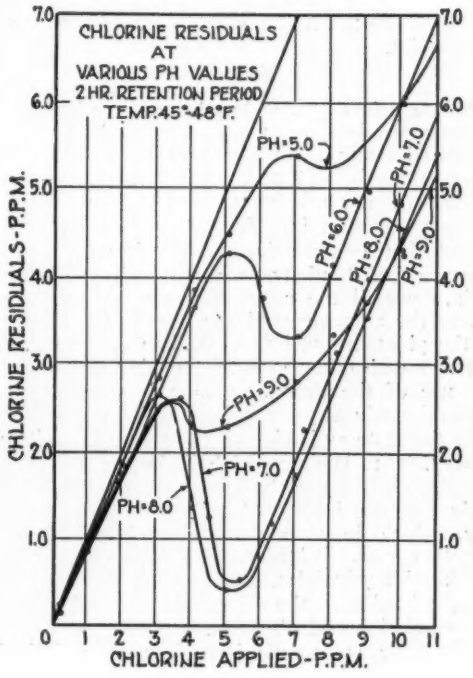
CHLORINE RESIDUALS AT VARIOUS PH VALUES 2 HR. RETENTION PERIOD TEMP. 45°-48°F.
PH-5.0
PH-6.0
PH-7.0
PH-8.0
PH-9.0
CHLORINE RESIDUALS-P.P.M.
CHLORINE APPLIED-P.P.M.
0 1 2 3 4 5 6 7 8 9 10 11
1.0 2.0 3.0 4.0 5.0 6.0 7.0

FIG. 2

are valuable to the successful chlorination of water.

In the course of development of the process it was shown that chloramines make up the majority of the residuals found in the region of the hump, but that they are nonexistant beyond the break. Furthermore, it was shown that twice as much chlorine was required to reach the top of the hump in the presence of 0.5 p.p.m. NH_3-N at pH 5.0, than at pH 9.0. This is shown in Fig. 3. This checks with the equations for the formation of mono- and di-chloramines as follows:

$$NH_3 + 2Cl_2 \rightarrow NHCl_2 + 2HCl \quad \text{(pH 4.5)} \qquad (1)$$

$$NH_3 + Cl_2 \rightarrow NH_2Cl + HCl \quad \text{(pH 8.5)} \qquad (2)$$

These data appear to confirm the opinion that mono- and di-chloramines are formed at the low concentrations ordinarily found in routine chlorination practice, and substantiates the general knowledge regarding the behavior of chloramines at the various pH values.

Control

Control of this process is somewhat more precise than the control of simple, or marginal chlorination. Control in the latter case is usually obtained by making frequent chlorine residual tests, augmented at times by bacteriological analyses. Reliance is also placed upon the familiar orthotolidin test except that special emphasis is placed upon the speed of production of the characteristic yellow color. When, upon the addition of orthotolidin, yellow color instantly develops and quickly reaches its full strength, sufficient chlorine has been added to reach or even pass the break-point. Proper time of contact of chlorine with water must be allowed before applying this test, however, for almost all waters will flash within the first few minutes following the addition of chlorine, assuming, of course, that any residual is present. This test, developed and used by Laux of Anderson, Ind., is known as the flash test. The point in the curve where the flash first appears is known as the flash point.

Principles

While primarily developed for the elimination of tastes and odors, plant scale use of the process has indicated many additional benefits, some of which have at times, and under particular circumstances, proven of more value than those for which the process was first intended. As an example, it was found that break point chlorination of the water entering the 30-mile transmission main at Little Rock, Ark., lowered the color of the water to the point where the alum demand for complete decolorization at the plant dropped from 0.60 to 0.40 g.p.g. This, together with other economies made possible through the use of the process, results in a net saving of approximately 45c per million gallons. At the same time the taste and odor of the water materially improved. At Weiser, Idaho, during the summer months, algae regularly increased to the point where their presence interfered with the formation of the floc, which in turn materially slowed down the filtration rate. Addition of chlorine, according to break-point principles, ahead of the alum resulted in the elimination of the odor and increased efficiencies in coagulation and filtration.

Not only is organic iron frequently difficult to remove, but it often seriously interferes with flocculation and sometimes imparts a disagreeable odor and color to water. All of these conditions prevailed at Crossville, Tenn., until chlorine was applied according to break-point technique. When this was done the chlorine converted the ferrous iron to the ferric so completely, that a good floc resulted. This floc not only removed the color from the water, but effected complete removal of the iron. Prior to the addition of chlorine to the break-point, inefficient coagulation and iron removal had been obtained by the use of alum. Following the adoption of the process the use of alum was dispensed with. During the peak of the difficulties 18 p.p.m. chlorine were used.

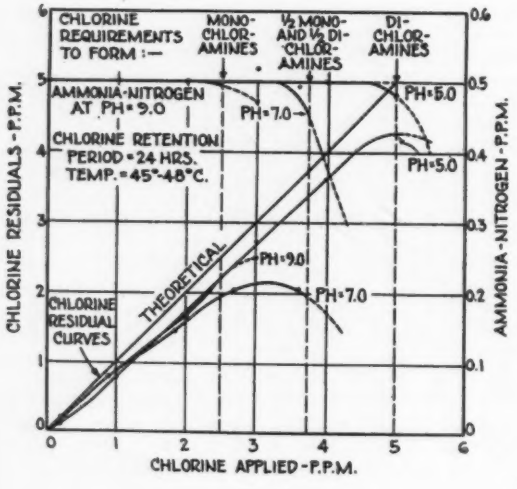

FIG. 3

Reduction of Residuals

Unless the chlorine demand of a water is fully satisfied, the residuals following chlorination will gradually drop to zero. The speed with which this reduction takes place usually depends upon the amount of organic matter originally present, and the amount of chlorine applied. Through break-point laboratory technique one is now enabled to determine, in the laboratory, the approximate amount of chlorine necessary to reach this point of stability, or to gain some idea of the level to which the residual will drop within a specified time in those cases where it is unnecessary to completely satisfy the chlorine demand. Where this demand can be satisfied, the residual will usually last over protracted periods. Where there is a tendency for these residuals to recede, they can usually be brought back to the desired levels with minor additions of chlorine. At Oklahoma City the residuals left after break-point chlorination, appear to be just as stable as the chloramines formerly used, as indicated by their presence in the farthest parts of the system. Here, greater bacterial reductions are being obtained than heretofore.

These examples have been selected without regard to size primarily because they represent a cross section of the conditions prevailing throughout the country. The experiences can and have been adapted for use in the manufacture of paper, where so much water is used, and where the quality of the product is of paramount importance.

Indications are that as valuable as the above benefits are, the additional bacterial removals beyond the break-point will prove of greatest interest to paper manufacturers. It is well known that tremendous bacterial kills are obtained by the chlorination of water at the first appearance of a residual. At this point practically all of the pathogenic organism disappear. All too frequently, however, certain organisms appear to survive what have been considered to be rather heavy applications of chlorine. In the water works industry these organisms have appeared in the form of nonconfirming gas formers, and in the paper industry, in the form of organisms which have later on showed up in the finished paper. In both cases these organisms should be eliminated.

Effect on Bacteria

Break-point chlorination now makes it possible to eradicate, or nearly eradicate, these undesirable organisms. Chlorination to the first appearance of a residual will usually remove 95 to 99% of the bacteria within the first few minutes.

Many times, however, it has been noticed that

further reductions require considerably more chlorine. With the advent of break-point chlorination it has been noted that these final reductions usually occur either at, or just beyond, the break-point. For instance, one case on record where slime forming bacteria were growing in profusion in the river, the source of water supply for a large paper mill, showed complete elimination in 2½ minutes by chlorination to a nominal residual (3.0- p.p.m.) beyond the break-point. Within the hump part of the curve where the residual was somewhat higher (4.1 p.p.m.), 3280 organisms were still present at the end of 2½ minutes and 850 still persisted at the end of an hour. (Results for other residuals and contact periods are shown in Table I). In this experiment a slime-forming organism having the greatest known resistance to chlorine sterilization was isolated from samples of slime collected from a fresh water treatment plant, and suspensions of this organism were prepared, using samples of the mill fresh water. Break-point chlorination was applied to these inoculated water samples. Points were selected on the break-point

TABLE I.—EFFECT OF BREAK-POINT CHLORINATION ON BACTERIA GROWING AT 37.5 DEG. C.

Added Chlorine, p.p.m.	Residual 1 min.	Residual 30 min.	Plate Count 37.5° C. Minutes Contact with Chlorine 1	2.5	5	10	30
1.0	0.8	0.45	9600	8200	7500	7300	5400
6.0	4.1	4.1	3500	3300	3000	2700	2000
19.5	15.2	1.8	13	38	1	1	0
22.0	17.0	3.3	100	0	0	0	0
Control			Start 21,000			End 5,500	
Control + alum (34.2 p.p.m.)			Start 24,500			End 4,200	

curve to correspond with chlorine dosage applications of 1.0, 6.0, 19.5, and 22 p.p.m. At intervals ranging from one minute to 120 minutes of chlorine contact, portions of the chlorinated suspension were removed, dechlorinated, and plated in suitable dilution in nutrient agar.

Although the bacterial count in this case did not go completely to zero, reductions were sufficient when the process was placed on a plant scale to eliminate the difficulties previously encountered.

Similar results were obtained on a laboratory scale at a third plant. Here, as in the former place, the bacteria were not completely eliminated although sufficient were removed on a plant scale to eliminate their carry over to the finished stock.

At another plant where the bacteria in the water were much lower (approx. 1600 per cc.), although of a type that resisted fairly substantial (0.45 p.p.m.) chloramine residuals, chlorination to the break-point lowered this count to a very low figure as evidenced by Table II.

Here it is to be noticed that by chlorination beyond the break-point the bacteria which resisted residuals as high as 3.37 p.p.m. in the hump part of the curve, were readily eliminated by residuals of 2.0 p.p.m. or less beyond the break-point.

These laboratory and plant scale experiences were substantiated by Levine[1] who showed that approxi-

TABLE II.—EFFECT OF BREAK-POINT CHLORINATION ON BACTERIA GROWING AT 37.5° C. AND IN A MARGINAL RESIDUAL OF 0.45 P.P.M.

	Contact 30 min.		60 min.		120 min.	
Cl_2 Added p.p.m.	Cl_2 Res. p.p.m.	Plate Count	Cl_2 Res. p.p.m.	Plate Count	Cl_2 Res. p.p.m.	Plate Count
0	0.45	130	.45	90	.45	90
0.3	0.50	90	.50	90	.48	100
0.9	0.49	130	.45	70	.37	100
1.8	0.60	70	.40	35	.18	30
2.7	1.00	16	.95	16	.70	2

TABLE III.—EFFECT OF BREAK-POINT CHLORINATION ON BACTERIA GROWING AT 37.5°C. AND IN A MARGINAL RESIDUAL OF 2.8 P.P.M.

	Contact 5 min.		40 min.		90 min.		150 min.		220 min.	
Cl_2 Added, p.p.m.	Cl_2 Res., p.p.m.	Plate Count	Cl_2 Res., p.p.m.	Plate Count	Cl_2 Res., p.p.m.	Plate Count	Cl_2 Res., p.p.m.	Plate Count	Cl_2 Res., p.p.m.	Plate Count
0	2.8	220	2.7	160	2.8	110	2.0	48	1.8	41
3.0	..	...	..	...	3.37	95	3.37	42	1.8	18
5.0	..	...	..	...	0.36	30	0.36	26	0.00	24
8.0	..	...	..	...	2.3	2	1.76	2	1.07	0

mately 90 minutes are required to effect a 99% kill of B. Metiens in the hump region of the break-point curve, whereas less than 3 minutes are required beyond the break-point.

Conclusions

Break-point chlorination laboratory study leads to an intimate knowledge of the chlorine characteristics of the water under treatments. The process is subject to practical plant control, under demonstrated laboratory and plant test. The process leads to increased purification efficiencies and to superior bacteriological removals.

Literature Cited

(1) Weber, George R., Bender, Richard and Levine, Max, *J. A. W. W. A.*, vol. 32, no. 11 (Nov., 1940).

General Engineering Handbook

The McGraw-Hill Book Company has just issued its second edition of Charles E. O'Rourke's General Engineering Handbook of 1115 pages. This book contains the important fundamental data relating to all branches of engineering. The important sections on mathematics, materials, mechanics and hydraulics have been entirely rewritten. More of the properties of plain concrete have been added as well as more thorough discussions of structural theory and design, engineering thermodynamics and electrical engineering principles.

Some of the sections of interest to engineers in the paper industry are those on physical tables, engineering materials, hydraulics, structural design, foundations, reinforced concrete, sanitation, pumps, compressors and hydraulic turbines, heating and air conditioning, and electrical engineering.

Copies may be obtained through the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y. The price of this book is four dollars.

Color Problems and National Defense

The Inter-Society Color Council, through its chairman, Deane B. Judd, has recently announced its services as a clearing house on problems of color, with particular reference to those relating to national defense. These services are available to the membership of TAPPI because the Association is a member of the Color Council. Members desiring information concerning color problems are asked to write R. G. Macdonald, secretary of the Technical Association of the Pulp and Paper Industry, who will pass on the inquiry to the Color Council.

Sulphite Pulp from Douglas Fir

By G. H. Chidester[1] and J. N. McGovern[2]

Abstract

The pulping action of calcium-base sulphite liquors, which do not ordinarily give complete reduction of Douglas fir, was improved by high sulphur dioxide concentration and long time at low temperature. The pulps were characterized by a dark color, long coarse fibers, fair bursting strength, and in some instances, high tearing resistance. They appear to have paper-making possibilities. Pulp having a high alpha-cellulose content can be produced by further purification and bleaching.

Wood variables had a considerable effect on the sulphite pulping of Douglas fir: sapwood was readily pulped whereas the heartwood was not; seasoned wood pulped more easily than green wood; old, slow-growth wood was more difficultly reduced than young, rapid-growth wood; top portions of trees yielded lower screenings and pulps with lower bleach requirements and tearing resistances than did lower portions; and short chips (¼ inch) were more suitable than average length chips (⅝ inch).

Sodium-base sulphite liquors reacted in a more normal pulping fashion than did calcium-base liquors and consequently reduced Douglas fir reasonably complete.

Both sodium bisulphite and sodium sulphite liquors reduced Douglas fir completely. The neutral sulphite liquor produced a fairly light-colored, high-strength pulp having a low bleach requirement but low yield.

Douglas fir, impregnated with sodium sulphite liquor, was completely pulped with a calcium-base sulphite liquor low in combined sulphur dioxide.

Ammonia-base sulphite liquors reacted toward Douglas fir similarly to sodium-base sulphite liquors.

Magnesium-base sulphite liquors occupied a position between calcium- and sodium-base liquors with respect to pulping Douglas fir. Magnesium bisulphite liquors, like sodium bisulphite, gave a high yield of hard-bleaching pulp with a small amount of screenings.

Introduction

The pulping of Douglas fir has had a prominent place in the program of the Forest Products Laboratory[3]. A number of investigations of pulping Douglas fir by the kraft, soda, acid sulphite, and neutral sulphite processes and by modifications of these processes have been made. It is the purpose of this report to summarize the work on sulphite pulping, showing results obtained with calcium-base sulphite liquor using different temperature schedules and liquor concentrations, with substitutions of sodium, ammonium, and magnesium for calcium in the cooking liquor, and with combinations of sodium and calcium as bases.

Experimental Part

The Douglas fir wood used in these experiments was derived from trees comprising several age and growth types. It was obtained through the cooperation of the Pacific Northwest Forest and Range Experiment Station. The physical and chemical properties of the woods are given in Table I. The wood was converted to ⅝-inch chips, and in one case to ¼-inch chips, in the usual manner. The various cooking reagents were prepared by passing sulphur dioxide from a cylinder into a suspension of calcium hydroxide, magnesium oxide, or a solution of sodium hydroxide. The concentrations of the cooking reagents are listed in the accompanying tables.

The digestions were carried out in experimental digesters of several types and sizes. These were (1) a 50-pound (pulp capacity) stationary digester having a ceramic lining, (2) a 50-pound alloy-lined digester, (3) a 1.5 cubic foot alloy-clad autoclave, and (4) perforated alloy baskets placed in the 50-pound alloy-lined digester. For the calcium-and sodium-base liquors digesters numbers (1), (2), and (4) were used; for the ammonium-base liquors digester number (1) was used; and for the magnesium-base liquor digester number (3) was used.

Digester operation and pulp testing methods followed the methods used at the Forest Products Laboratory.

Wood

The Douglas fir wood used was derived from trees which showed a wide range of age and growth rates. The data in Table I show the properties of trees whose age varied from 37 to 364 years and whose growth rate varied from 5.1 to 52.9 rings per inch. All the trees contained more than 56% heartwood. Although considerable difference exists between the properties of the top and butt portions of any one

[1] Member TAPPI, Senior Engineer, Forest Products Laboratory,[3] Forest Service, U. S. Department of Agriculture.
[2] Member TAPPI, Assistant Technologist, Forest Products Laboratory,[3] Forest Service, U. S. Department of Agriculture.
[3] Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

TABLE I.—PHYSICAL AND CHEMICAL PROPERTIES OF DOUGLAS FIR USED IN SULPHITE PULPING EXPERIMENTS

Shipment	Tree number	Age Years	Growth rate Rings/inch	Density Lb./cu. ft.	Summer-wood content %	Heart-wood content %	Lignin %	Cellulose Alpha %	Cellulose Total %	Solubility in Alcohol-benzene %	Solubility in Ether %
1466	6[1]	62	8.0	25.0	25	61	27.1	45.9	62.8	2.8	0.5
1466	6		Heartwood from bolts characterized above				27.3	43.7	61.5	3.3	1.0
1466	6		Sapwood from bolts characterized above				25.4	46.2	63.2	1.6	0.4
1528	1[2]	37	5.1	27.9	31	56	25.4	46.0	62.2	3.8	0.8
1528	6[2]	98	5.9	27.6	37	71	28.9	43.9	57.1	4.0	1.2
1466	4[1]	364	52.9	20.7	21	70	29.6	41.8	56.5	3.2	0.3
1344	Average for shipment	55	9.0	30.5	..	65	28.1	44.6	60.2	3.9	0.7
1528	6[3]	114	6.7	26.1	36	76	29.0	41.4	58.2	5.9	0.9

[1] Results for middle bolt of tree.
[2] Average results for top, middle, and butt bolts (green).
[3] Results for bolt 25% of total height above stump.

tree, the data thus far obtained indicate a greater range of values among different trees than within a single tree.

Pulping Douglas Fir with Calcium-Base Sulphite Liquor

The difficulties encountered in pulping Douglas fir by the ordinary sulphite pulping procedure are shown by the results from Digestions 3758-I, 1 and 3, Table IV, and 3752, Table V. The incomplete reduction of the wood is shown by the high screenings, 13.9 and 20.2%, respectively. In such instances decomposition of the bisulphite occurred before the digestion was completed, the liquor turned black, and preciptation of bisulphite decomposition products often occurred. The pulp was usually dark-colored, low in strength, and contained many shives. These difficulties in reduction were thought to be caused principally by the heartwood since the sapwood, as is shown later, is readily reduced to pulp.

The incomplete pulping of the heartwood by ordinary sulphite liquor has been variously attributed to lack of sufficient penetration of the liquor into the chips, to more resistant lignin, to lack of sufficient diffusion during cooking, to decomposition of sulphur dioxide selectively absorbed, to decomposition of the bisulphite by certain extractives, and to several other possible causes. Lack of sufficient penetration might well be a contributing factor when the wood is cooked under ordinary conditions. However, indicator tests on Douglas fir have shown complete penetration of the bisulphite in about twice the length of time required by spruce or hemlock. It is possible, by allowing sufficient time for penetration of the bisulphite, to avoid the hard, dark centers of the chips that are indicative of burning due to lack of penetration. In this case the screenings comprise chips which have been softened, and if the digestion is carried to exhaustion of the bisulphite but not beyond that point, the chips then will have the appearance of being undercooked rather than burned. Their partial delignification is indicated by a lignin content of 16.4% in one instance where the screenings amounted to 8.5% of the wood.

The condition of the screenings indicate a less reactive lignin or an insufficient supply (or faulty distribution) of chemical toward the end of cooking rather than an initial lack of penetration. With respect to the former, Bailey *(1)* found the lignin molecule in Douglas fir to differ from that in other woods, but concluded that there was no apparent reason why Douglas fir could not be reduced chemically to sulphite pulp. Beuschlein *(5)*, on the other hand, attributed the greater resistance of extracted Douglas fir to sulphite liquor as compared with spruce to a denser packing of the lignin in the cell walls of the Douglas fir. Further, Erdtman *(8)* isolated from the heartwood of *Pinus sylvestris* certain stilbene derivatives which hinder pulping by combining with the lignin to render it less soluble. Investigations are now under way to determine whether a substance exists in Douglas fir that may have a similar effect in sulphite pulping. Several investigators have indicated that, generally, certain parts of the lignin molecule are more resistant to solution than others; possibly the relation of these lignin types is unfavorable in Douglas fir.

As far as insufficient chemical is concerned, this condition may arise in several ways. Hägglund *(10)*, for instance, has shown that in the pines diffusion of the products of reaction out of the cells is difficult; this may possibly be the case with Douglas fir. Decomposition of the bisulphite may also be important in pulping Douglas fir as well as the pines. Perhaps, as suggested by Schmidt *(12)*, decomposition of sulphur dioxide in the interior of the chips may be a contributing factor. Furthermore, in the opinion of Brookbank *(6)* certain pinene derivatives in Douglas fir cause decomposition of the bisulphite. Brookbank *(6)* likewise believes that Douglas fir fails to elevate the precipitation temperature as much as spruce; thus calcium sulphite precipitation occurs at relatively low temperatures.

The pitchy character of Douglas fir has been blamed for the difficult pulping *(14)*, although the amount of ether extractable material is less than that in spruce.

Sulphur Dioxide Concentration and Maximum Temperature

Considerable improvement in the reduction of Douglas fir with calcium bisulphite liquor can be obtained by increasing the sulphur dioxide content of the liquor and by employing low temperatures accompanied by an increase in the cooking time. This temperature effect has been observed by Brookbank *(6)*, and the effects of both acid concentration and temperature in the pulping of Douglas fir and resinous woods have been reported by Chidester and McGovern *(7)*. Increasing the free sulphur dioxide content of the liquor from 2.75 to 5.75% with the combined 1.35% in both cases, reduced the screenings from the heartwood from 13.1 to 1.5% at 130 deg. C., and from 18.0 to 6.5% at 145 deg. C. maximum temperature (Table II). The difference for

TABLE II.—EFFECT OF SULPHUR DIOXIDE CONCENTRATION AND MAXIMUM TEMPERATURE IN PULPING DOUGLAS FIR HEARTWOOD AND SAPWOOD

Digestion [1]	Wood [2]	Total sulphur dioxide %	Total time Hours	Yield		Unbleached blue color Ives parts	Bleach requirement %	Burst [3] factor at 550 cc. freeness [4] Pts./lb./ream	Tear [3] factor at 550 cc. freeness [4] G./lb./ream	Solubility in	
				Screened %	Screenings %					Alcohol-benzene %	Ether %
Maximum temperature, 130 deg. C.; time (110 to 130 deg.) 6 hours											
3753-1	Heartwood	7.1	16.0	49.2	1.5	34	27	1.09	1.05	0.8	0.4
3754-1	Heartwood	4.1	21.0	41.1	13.1	30	36	1.00	1.05	0.8	0.5
Maximum temperature, 145 deg. C.; time (110 to 145 deg.) 1.5 hours											
3750-1	Heartwood	7.3	9.5	44.8	6.5	31	35	1.01	1.40	1.0	0.2
3752-1	Heartwood	4.1	10.0	36.5	18.0	24	40	0.91	1.10	0.5	0.5
3750-5	Sapwood	7.3	9.5	46.4	0.8	47	12	1.02	1.90	1.8	..
3752-2	Sapwood	4.1	10.0	44.7	2.9	42	20	0.94	1.35	0.3	0.4

[1] Digestion conditions: Acid—1.35% combined sulphur dioxide; penetration—2 hours to 110 deg. C., 2 hours at 110 deg. C.; pressure—75 pounds per square inch maximum.
[2] Shipment 1466, Table I.
[3] Beater tests, 25x40—500 ream.
[4] Schopper-Riegler.

sapwood was much less owing to better reduction with the weaker liquor (Table II). The screenings were likewise reduced to a marked degree by lowering the temperature and increasing the cooking time (Table II).

Wood Variables

The greater difficulty in pulping the heartwood of Douglas fir is shown by the relatively high percentages of screenings compared to those for the sapwood in Table II. This difference is of particular significance when the possibility of cooking slabs containing a high proportion of sapwood is considered.

The sulphite pulping of Douglas fir is affected by other properties of the wood in addition to heartwood content. This was true of the southern pines and western hemlock which have been examined. For instance, it has been found that in general better reduction is obtained from seasoned wood than from green wood. In Table III the average results from two Douglas fir trees are compared for the green and seasoned wood. The green wood yielded, on the average, 6.6% screenings, whereas the seasoned wood yielded only 2.3% screenings.

The age and position of the wood in the tree affect the pulping of Douglas fir. As shown in Table III, a young tree (37 years old—Tree 1, Shipment 1528, Table I) gave 5.1% screenings and an older tree (98 years old—Tree 6, Shipment 1528, Table I) gave 8.2% screenings. An old tree (364 years old) gave a screenings of 13.0%.

The difference in average results from the top, middle, and butt portions of two Douglas fir trees is shown in Table III. The top and middle portions of the trees gave lower screenings than the butt portions. Pulps from the top portions showed a lower tearing resistance than pulps from the lower portions of the trees, probably owing to the higher proportion of springwood in the tops. Pulps from the top portions had lower bleach requirements than pulps from the lower portions.

The pulping of Douglas fir is benefited to some extent by the use of relatively short chips, possibly a result of improving the conditions for liquor movement in and out of the chips. The digestion data for ¼-inch and 5/16-inch chips are given in Table IV. The screenings were materially decreased by the use of the ¼-inch chips, and this was accompanied by a slightly lower bleach requirement and slightly lower maximum strength properties. A further advantage in the use of short chips was gained in making mimeo bond paper in that the shortening of the fibers reduced the amount of wet processing and gave an improved sheet *(11)*.

TABLE IV.—SULPHITE DIGESTIONS OF ¼ AND 5/16-INCH DOUGLAS FIR CHIPS

Digestion [1]	Chip length,[2] Inch	Yield: Screened, %	Yield: Screenings, %	Bleach requirement, %	Burst [3] factor at 550 cc. freeness,[4] Pts./lb./ream	Tear [3] factor at 550 cc. freeness,[4] G./lb./ream
3758-I-1 and 3	5/16	38.8	13.9	34	0.93	1.32
3758-I	¼	48.4	3.2	28	0.84	1.15

[1] Digestion conditions: Acid—4.05% total with 1.35% combined sulphur dioxide; temperature schedule—2 hours to 110 deg. C., 2 hours at 110 deg. C., 1.5 hours 110 to 145 deg. C., total time 10.2 hours; pressure—75 pounds per square inch maximum.
[2] Wood—shipment 1466, Table I.
[3] Beater tests, 25 x 40—500 ream.
[4] Schopper-Riegler.

Characteristics of Douglas Fir Pulps

Outstanding characteristics of Douglas fir sulphite pulps are their comparatively dark color in the unbleached condition and their long, coarse fibers. The color would probably necessitate bleaching the pulps for most purposes. The long, coarse fibers account for the relatively high tearing resistance of Douglas fir pulps and their tendency to be bulky. The bursting strengths are somewhat lower than the average for spruce or western hemlock. Douglas fir can perhaps be used advantageously in mixtures with other pulps, as already suggested *(6)*. The mimeograph bond sheet previously mentioned exemplified a wide range of possible application.

Relatively pure pulps can be produced from Douglas fir by purification and bleaching methods, as indicated by the following chemical analysis of Douglas fir sulphite pulp so treated:

Alpha-cellulose	88.8%
Beta-cellulose	3.4%
Ash	0.3%
Total pentosans	3.5%
Copper number	2.4
Viscosity	19.8 cps.

Pulping with Sodium-Base Liquor

Comparison with Calcium-Base Liquor

The improved reduction of heartwood and sapwood separately, as well as of a mixture of the two, obtained with sodium-base liquor is shown in comparison with the results from calcium-base liquor in Table V. Under comparable conditions reasonably complete pulping of the heartwood as well as of the sapwood was obtained with sodium-base liquor with

TABLE III.—COMPARISON OF SULPHITE PULPS FROM GREEN AND SEASONED TOP, MIDDLE, AND BUTT BOLTS FROM YOUNG AND OLD DOUGLAS FIR TREES

Digestion [1]	Wood [2]: Tree number	Wood [2]: Age class	Wood [2]: Position in tree	Chip condition	Total time, Hours	Yield: Screened, %	Yield: Screenings, %	Bleach requirement, %	Burst [3] factor at 550 cc. freeness,[4] Pts./lb./ream	Tear [3] factor at 550 cc. freeness,[4] G./lb./ream
				Effect of Seasoning						
3895 and 3896	Average of 1 and 6	Average of young and old	Average of top, middle, and butt	Green	15.8	41.2	6.6	18.0	0.70	1.00
3900 and 3902				Seasoned	15.2	47.5	2.3	23.4	0.78	0.94
				Effect of Age						
3896	1	Young	Average of top, middle, and butt	Green	16.0	41.9	5.1	14.1	0.68	1.05
3895	6	Old		Green	15.5	40.4	8.2	21.9	0.72	0.95
				Effect of Position in Tree						
	Average of 1 and 6	Average of young and old	Top	Average of green and seasoned	15.5	44.8	2.3	19.0	0.75	0.89
			Middle		15.5	45.1	3.8	21.7	0.76	1.01
			Butt		15.5	43.1	7.4	21.4	0.73	1.00

[1] Digestion conditions: Acid—7% total with 1.35% combined sulphur dioxide; temperature schedule—2 hours to 110 deg. C., 2 hours at 110 deg. C., 6 hours 110 to 130 deg. C.; pressure—75 pounds per square inch maximum.
[2] Shipment 1528, Table I.
[3] Beater tests, 25x40—500 ream.
[4] Schopper-Riegler.

TABLE VI.—PULPING DOUGLAS FIR WITH SODIUM BISULPHITE OR NEUTRAL SULPHITE LIQUORS

Digestion	Shipment number of wood	Liquor: Total SO_2 %	Liquor: Combined SO_2 %	Digestion conditions [1]: Maximum temperature deg. C.	Digestion conditions [1]: Time to maximum temperature hours	Total time hours	Yield: Screened %	Yield: Screenings %	Bleach requirement %	Maximum [2] burst factor Pts./lb./ream	Maximum [2] tear factor G./lb./ream
3468	1344	6.24	1.50	140	9.0	11.25	50.0	1.7	32	0.87	2.31
3484	1344	6.03	3.00	160	11.5	11.75	55.7	1.6	[3]	.97	2.08
3764-5	1466	7.00	7.00	181	4.5	10.00	43.3	.1	24	1.52	2.50

[1] Maximum pressure, 75 pounds per square inch.
[2] Pebble mill tests, 25x40—500 ream.
[3] More than 30%.

Note: Combined sulphur dioxide is calculated as the monosulphite equivalent. The cooking liquor in Digestion 3468 thus contains bisulphite and sulphurous acid; in no. 3484, essentially bisulphite only; and in 3764-5, monosulphite, only.

consequent improvement in the strength properties of the pulps and in the bleach requirement. Decomposition of the bisulphite near the end of the digestion appears to be at least delayed with the sodium bisulphite liquor, permitting the digestion to be continued more nearly to completion.

When only half of the calcium was replaced by an equivalent amount of sodium as in No. 3756, 3756-1, and 3756-2 (Table V), the improvement was less than that shown when all of the calcium was replaced, but was proportionally greater than the amount of sodium substituted.

Pulping with Sodium Bisulphite and Sodium Sulphite

The solubility of sodium bisulphite and sodium sulphite permits their use as pulping agents without excess sulphur dioxide. Use of these liquors has shown further advantages for soda-base liquors. Sodium bisulphite liquor gave in one instance a higher yield of screened pulp with a smaller percentage of screenings than did a liquor with 4.74% free sulphur dioxide (No. 3484 and 3468, Table VI). Although the high yield in this case was obtained at the expense of a high bleach requirement, results from other woods indicate that relatively higher yields are obtainable with liquor of the same composition when the pulps were cooked to lower bleach requirements. The higher temperature required by the sodium bisulphite liquors is given in Table VI.

That neutral sodium sulphite liquor gives good reduction of Douglas fir is shown in Table VI (No. 3764-5). The pulp prepared with this liquor was light-colored, bleachable, and relatively strong in both burst and tear. At the same time the screenings were low. In most respects the results obtained by this procedure were probably the most generally satisfactory by any of the methods tried. Haffner and Kobe *(9)* have found that Douglas fir can be pulped by a sodium sulphite process. Its commercial application, however, is dependent upon an economical method for recovering chemicals from the waste liquor.

Impregnation with Sodium Sulphite Followed by Cooking with Calcium Bisulphite Liquor

A procedure which has given good reduction of Douglas fir with a comparatively low consumption of soda was developed by impregnating the chips with sodium sulphite liquor, and following with digestion with calcium bisulphite liquor. Penetration of the sodium sulphite was obtained by filling the digester with chips and the sodium sulphite liquor, raising the temperature to 102 deg. C., and holding for 1 hour. The excess liquor was then blown into a storage tank, after which the calcium bisulphite liquor was introduced. Since a part of the combined sulphur dioxide consisted of the sodium salt, the calcium bisulphite liquor had a lower concentration of combined SO_2 than would otherwise be required. Conditions found to give a satisfactory pulping action are given in Table VII. In comparison with the results from mixed calcium and sodium bisulphite liquor (No. 3756, Table V), the impregnation method gave slightly better reduction with a lower consumption of soda. In this connection Benson *(2)* has patented a hot ammonium hydroxide extraction of Douglas fir followed by an ordinary calcium base sulphite cook.

Pulping with Ammonium-Base Sulphite Liquor

The action of ammonium-base liquors on Douglas fir was similar to that of sodium-base liquors. Using relatively high combined sulphur dioxide contents in the cooking liquor, low screenings and high yields of difficulty bleached pulp resulted. A typical digestion gave 1.8% screenings, 50.9% screened yield, and a pulp with a bleach requirement of 30%. Benson and colleagues *(3, 4)* have reported considerable success with pulping Douglas fir with ammonium bisulphite liquors.

Pulping with Magnesium-Base Sulphite Liquor

Recent developments in the recovery of chemicals from magnesium bisulphite spent liquor *(13)* have opened possibilities in their commercial application. Experiments to determine the effectiveness of such

TABLE V.—PULPING DOUGLAS FIR WITH SODIUM, CALCIUM, AND SODIUM-CALCIUM BASE SULPHITE LIQUORS

Digestion [1]	Wood [2] type	Base used [3]	Total time Hours	Yield: Screened %	Yield: Screenings %	Blue color of unbleached pulp Ives parts	Average bleach requirement %	Burst [4] factor at 550 cc. freeness [5] Pts./lb./ream	Tear [4] factor at 550 cc. freeness [5] G./lb./ream	Solubility in: Alcohol-benzene %	Solubility in: Ether %
3752	Whole wood.....	Calcium	10.1	37.1	20.2	33	33	0.93	1.10	0.8	0.4
3756	Whole wood.....	Sodium	11.2	49.8	.6	42	13	1.10	1.35	.4	.3
3757	Whole wood.....	Calcium-sodium	10.9	48.4	2.9	40	21	1.04	1.00	.5	.2
3752–1	Heartwood	Calcium	10.1	36.5	18.0	24	42	.91	1.10	.5	.5
3756–1	Heartwood	Sodium	11.2	48.0	1.4	35	23	1.07	1.40	.8	.5
3757–1	Heartwood	Calcium-sodium	10.9	45.3	4.5	31	25	.94	1.10	.8	.4
3752–2	Sapwood	Calcium	10.1	44.7	2.9	42	17	.94	1.35	.3	.4
3756–2	Sapwood	Sodium	11.2	46.4	.1	51	8	1.02	1.75	.4	.5
3757–2	Sapwood	Calcium-sodium	10.9	48.1	.1	52	8	1.05	1.60	.4	.1

[1] Digestion conditions: Acid—4.1% total with 1.35% combined sulphur dioxide; temperature schedule—2 hours to 110 deg. C., 2 hours at 110 deg. C., 1.5 hours 110 to 145 deg. C.; pressure—75 pounds per square inch.
[2] Shipment 1466, Table I.
[3] The calcium-sodium base liquor contained half the base as calcium and half as sodium.
[4] Beater tests, 25x40—500 ream.
[5] Schopper-Riegler.

TABLE VII.—PULPING DOUGLAS FIR WITH PRELIMINARY IMPREGNATION OF SODIUM SULPHITE AND SODIUM BICARBONATE

(DIGESTION 3546, WOOD SHIPMENT 1344)

	Sodium sulphite	Sodium bicarbonate (calculated as sodium carbonate)
Impregnation conditions:		
Concentration of chemicals in impregnating liquor (g./l.)	13.6	7.2
Maximum pressure (lb./sq. in.)	85	...
Temperature of impregnation (deg. C.)	102	...
Time of impregnation (hours)	1.00	...
Chemical consumption based on moisture-free wood (%)	1.5	0.8
Equivalent sodium carbonate consumption (%)	2.1	...

	Combined SO_2	Total SO_2
Digestion conditions:		
Acid composition (%)	0.95	6.08
Base used	Lime	...
Time to 115 deg. C. (hours)	1.00	...
Maximum temperature (deg. C.)	148	...
Time to maximum temperature (hours)	6.00	...
Time of digestion (hours)	8.75	...

	Screened	Screenings	Total
Yield of moisture-free pulp per 100 wood (pounds)	50.8	1.2	52.0
Color of unbleached pulp (Ives parts blue)	37	...	...
Bleach requirement (%)	18	...	...

Pebble mill strength data:

Pulp not milled:	
Burst factor, 24x36—500 (pts./lb./ream)	0.17
Tear factor (g./lb./ream)	1.10
Double folds	2
After 40 minutes milling:	
Burst factor	0.79
Tear factor	1.96
Double folds	197
After 80 minutes milling:	
Burst factor	0.83
Tear factor	1.27
Double folds	368

liquors in pulping Douglas fir are now in progress. Results up to the present indicate that as far as concerns the degree of reduction as measured by the amount of screenings, magnesium bisulphite liquor lies between calcium and sodium bisulphites in effectiveness. A comparison of the results from calcium-and magnesium-base digestions carried out under the same conditions (except for a longer time allowed by the magnesium-base liquor) is shown in Table VIII. The relatively low amount of screenings and pulp bleach requirements are evident for the magnesium-base digestions, although the pulp strengths differ little. The respectively improved pulping with calcium, magnesium- and sodium- (or ammonium-) base sulphite cooking liquors would seem to point out that the respective solubilities and stabilities of the cooking reagents and of the products of the cooking reaction play an important part in the pulping of Douglas fir.

An advantage held in common by both magnesium and sodium bisulphite liquors is their greater solubility over calcium bisulphite liquors. With a constant

TABLE VIII.—PULPING DOUGLAS FIR[1] WITH CALCIUM- AND MAGNESIUM-BASE SULPHITE LIQUORS

Digestion[2]	Base used	Total time, hours	Yield: Screened, %	Yield: Screenings, %	Unbleached blue color, Ives parts	Bleach requirement, %	Burst[3] factor at 550 cc. freeness[4] Pts./lb./ream	Tear[3] factor at 550 cc. freeness[4] G./lb./ream
239-41	Magnesium	9.65	45.6	2.4	38	18.9	0.68	0.98
237-59	Calcium	8.85	43.3	5.9	39	23.6	.74	1.05

[1] Wood—Shipment 1528, Table I.
[2] Digestion conditions: Acid—7% total with 1.25% combined sulphur dioxide; temperature schedule—1.5 hours to 110 deg. C., 1.0 hour at 110 deg. C., 3.5 hours 110 to 140 deg. C.; pressure—130 pounds per square inch (no relief).
[3] Beater tests, 25x40—500 ream.
[4] Schopper-Riegler.

TABLE IX.—PULPING DOUGLAS FIR[1] WITH MAGNESIUM-BASE SULPHITE LIQUORS OF HIGH AND LOW COMBINED SUDPHUR DIOXIDE

Digestion[2]	Acid: Total SO_2, %	Acid: Combined SO_2, %	Tota time, hours	Pressure,[3] Lb./sq. in.	Yield: Screened, %	Yield: Screenings, %	Bleach requirement, %	Burst[4] factor at 550 cc. freeness[5] Pts./lb./ream	Tear[4] factor at 550 cc. freeness[5] G./lb./ream
239-41	7.0	1.25	9.65	129	45.6	2.4	18.9	0.68	0.98
234	9.4	3.6	11.0	130	49.1	1.8	16.2	0.68	1.10

[1] Wood—Shipment 1528, Table I.
[2] Digestion conditions: Temperature schedule—1.5 hours to 110 deg. C., 1.0 hour at 110 deg. C., 3.5 hours 110 to 140 deg. C.
[3] No relief.
[4] Beater tests, 25x40—500 ream.
[5] Schopper-Riegler.

free sulphur dioxide content, a high concentration of combined sulphur dioxide brought about an improved reduction of Douglas fir, as shown in Table IX. In another experiment a magnesium bisulphite liquor containing no free sulphur dioxide led to a high yield (51%) of hard bleaching pulp although with a fairly low amount of screenings (2.1%).

Conclusions

The sapwood of Douglas fir was readily reduced to pulp by calcium bisulphite liquor. The heartwood as well as the sapwood of comparatively young trees was reduced fairly satisfactorily by the use of a low-temperature schedule of long duration together with liquor of a high sulphur dioxide concentration. Short chips were more easily pulped than long chips. Better reduction was obtained from seasoned wood than from green wood; likewise, young trees and the upper portions of trees were more readily reduced than older trees and the lower portions.

The unbleached pulps were comparatively dark-colored, had a fair bursting strength, and in some instances a high tearing resistance. The dark color of the unbleached pulp would necessitate bleaching for most purposes. Owing to its fiber characteristics, Douglas fir sulphite pulp could probably be used to best advantages by blending with other pulps. Their usefulness could undoubtedly be extended by the development of suitable processing conditions. Pulps having high alpha-cellulose contents can be obtained on further purification.

Magnesium-base sulphite liquor gave somewhat improved reduction in comparison with calcium-base liquor, and still further improvement was obtained with sodium-base liquor. Neutral sodium sulphite liquor gave excellent reduction to a fairly light-colored, strong pulp.

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Kraft Pulping with Low Sulphidity*

By S. D. Wells[1] and Kenneth A. Arnold[2]

Abstract

The benefits derived from the buffering action of the sulphide in a normal kraft liquor may be obtained by continuous injection of a liquor of low sulphidity during cooking. In pulping conifers and possibly other woods, a small but definite amount of sodium sulphide is necessary to obtain optimum pulp properties. A more complete utilization of active chemicals is possible by employing preliminary impregnation with black liquor. The organic salts present in this liquor act as buffering agents in maintaining even distribution of the active chemicals.

The pulps resulting from injection cooks are 10% higher in maximum bursting strength and 15% higher in maximum tearing resistance than average kraft pulps.

A marked reduction in mercaptans and other substances causing objectionable odors was noted during a cook with a liquor of low sulphidity.

One of the most important variables in kraft pulping is the sulphidity of the cooking liquor. Throughout the following paper, the term sulphidity is defined as the ratio of the sodium sulphide to the sum of the sodium sulphide plus the sodium hydroxide, all expressed as Na_2O. As the sodium sulphide in the cooking liquor is derived directly from the sulphate used as make-up chemical, it is evident that the more efficiently a kraft mill is operated, the lower should be the sulphide ratio in the cooking liquor from the recovery.

From the survey of the literature, it is evident that adding sulphide in limited proportions to a soda liquor increases the rate of delignification and results in a stronger pulp *(1-3)*. It is generally assumed that the sodium sulphide hydrolyzes to sodium hydroxide and sodium hydrosulphide, and Hanson *(4)* has shown that the latter alone, if used in sufficient quantities, will produce a satisfactory pulp. The action seems to involve more clear-cut splitting off and less breaking down of the noncellulosic constituents than is the case with sodium hydroxide, and this is reflected in the easier bleachability of the pulps obtained. The latter phenomenon is somewhat complicated, however, by the greater resistance to bleaching of the coloring matter left in the pulp as the proportion of sulphur taken up thereby is increased *(1, 5, 6)*.

Lowering the concentration of chemical in sulphate liquor, without changing total chemical, increases the yield, strength, and bleachability of the resulting pulps *(3, 8)*. If the sulphate liquor becomes more acid than pH9, however, the lignin compounds tend to become insoluble in alkali *(7)*. Impregnation of the chips with sulphate liquor before cooking was beneficial to the pulp properties and to economy of operation *(9)*. The only undesirable effect of adding black liquor up to 50% as a diluent in kraft cooks was a noticeable darkening of the resulting pulps *(10)*.

Problem

In view of these observations, an attempt was made to obtain the buffering action of the usual amount of sulphide in kraft liquor by mechanical means—the injection of a low sulphide liquor during the cook. In the normal kraft liquor there is sufficient sodium sulphide to act as a reservoir for supplying more sodium hydroxide by hydrolysis as the latter is consumed. This action maintains the concentration of excess caustic below a certain critical value during the early stages of the cook and is probably the main advantage of using cooking liquors with sulphidity as high as 33%. Sodium hydrosulphide, the other product of the hydrolysis of sodium sulphide, is apparently a specific solvent for lignin not readily dissolved by sodium hydroxide, but the amount required for this purpose is probably much less than the amount furnished in the usual cooking ratio of two parts of sodium hydroxide to one part of sodium sulphide. This is indicated by the large amounts of mercaptans and other organic sulphides usually formed during the cooking. It should be possible to furnish just enough hydrosulphide to combine with the lignin, and yet obtain the buffering action of the usual proportion of sodium sulphide, by injecting a cooking liquor of low sulphidity during the early part of the cook. This operation would make it possible to maintain the excess chemical at a low concentration, and at the same time to reduce the odor due to mercaptans. In order to obtain a uniform and rapid distribution of the injected liquor, it is desirable to have a considerable volume of diluting liquor in circulation. Furthermore, the chips must be thoroughly impregnated at the start of the cook to provide a means for the immediate diffusion of the active alkali.

The use of black liquor for impregnation of the chips before cooking, offers two obvious advantages: a better utilization of the chemical in the black liquor is obtained, and the liquor so introduced into the chips acts as a diffusion medium.

Experimental Methods

For pulping, bolts of jack pine were chipped in a Carthage semicommercial chipper, the knives of which were set to produce ⅝-inch chips. Sawdust was removed by screening and the slivers, knots, and larger pieces by hand sorting.

The sulphate cooking liquor was analyzed for sodium hydroxide and sodium sulphide using the TAPPI Standard method. The black liquors were analyzed for the active alkali titratable to the phenolphthalein end point after precipitation with barium chloride, the total alkali (the sodium carbonate remaining after incineration), and the alkali sulphide (all expressed as sodium oxide). The sulphide was determined by the method proposed by McIn-

* A portion of a thesis submitted by the junior author in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., June, 1940.

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tyre *(11)*. This method consisted of the evolution of the sulphide from an untreated sample of black liquor by ammonium chloride, using neutral cadmium sulphate solution to absorb the liberated sulphide. The cadmium sulphide was filtered off and treated with acidified iodine, the excess of which was back-titrated with standard thiosulphate. The sodium hydroxide content was calculated from the results of the active alkali and the sulphide titrations.

Cooking Procedure

The chips were cooked in a stationary iron digester having a capacity of 6000 grams (moisture-free weight) of chips. The liquor was heated by circulation through an external heat exchanger, as shown in Fig. 1. The pressure chamber *C* acted as a reservoir for holding the liquor to be injected; the valve *V* regulated the rate of flow into the circulation line. Pressure was supplied to the chamber from a cylinder of compressed nitrogen. The volume of liquor was indicated by the external glass gage calibrated in cubic centimeters.

The chips were added to the digester, and the volume of black liquor prepared for impregnation poured on them. The top of the digester was bolted on, and the injection chamber partially filled with water. About 10 pounds of nitrogen pressure were applied to the chamber, and the injection valve was opened. The circulating pump was started, and steam was admitted to the heater at such a rate that the digester was brought up to 120 deg. C. in one-half hour (straight-line rise). The hydrostatic pressure was gradually increased to 120 lb. per sq. in. during this half-hour period by regulating the nitrogen bomb valve.

The relief valve *R* was opened momentarily at 100-pound pressure. The digester was held at 120 deg. C. and 120 pounds for 45 minutes to thoroughly impregnate the chips with black liquor; the steam was shut off, and enough black liquor was blown back through the sample line so that the correct volume of liquor for the cook was left in the digester.

The first cook was made as the standard cook with water, chips, black liquor, and normal kraft cooking liquor added to the digester; the cook was conducted in the usual manner. In the ninth cook, as much of the liquor as possible was withdrawn after impregnation, and the volume for cooking was made up with hot water. The procedure in the tenth cook differed from the rest in that white liquor of the same active chemical concentration as the black liquor was used for impregnation.

The sample line was closed, and the cooking liquor was added to the injection chamber. The chamber was closed and 120 pounds of nitrogen pressure ap-

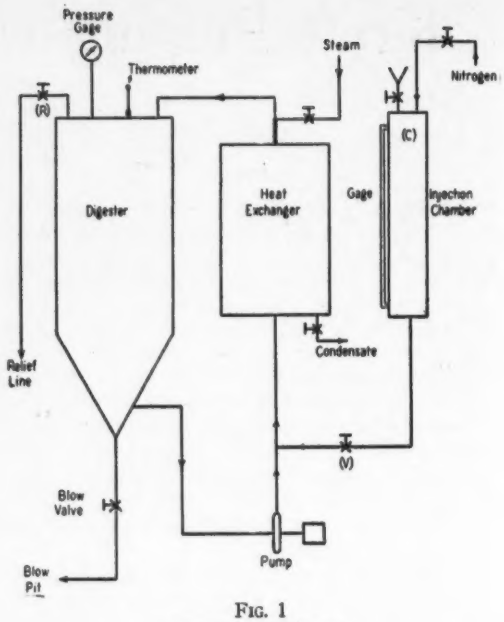

Fig. 1
Experimental Digester

plied to it. The pump was then started and the injection valve opened until 20% of the liquor was forced into the digester. The temperature schedules are given in Fig. 2, and the injection schedules in Fig. 3. The total time required for the cooks with impregnation and injection was the same as that for the standard cook.

On completion of the cook the digester was relieved to 50 pounds and the charge blown into the blowpit. The black liquor was pressed from the pulp, and the pulp washed three times with hot water and put through a flat screen having slots 0.010 inch in width. The yield was determined from the moisture-free weight of screened pulp, screenings, and the moisture-free weight of the wood cooked.

The permanganate number of the pulp was determined according to Institute Method 410 using 40.0 cc. of 0.1 *N* potassium permanganate.

The rate of development of the physical properties of the unbleached pulp was evaluated by a 1.5-pound laboratory beater. A set of five sheets was made at each beating interval, the sheets being formed ac-

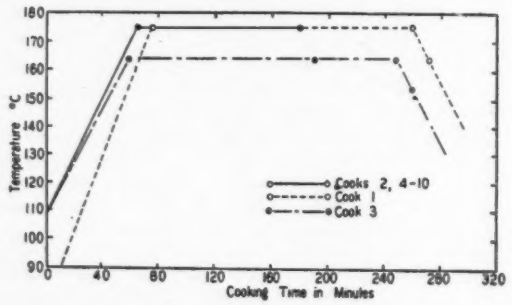

Fig. 2
Temperature Schedules

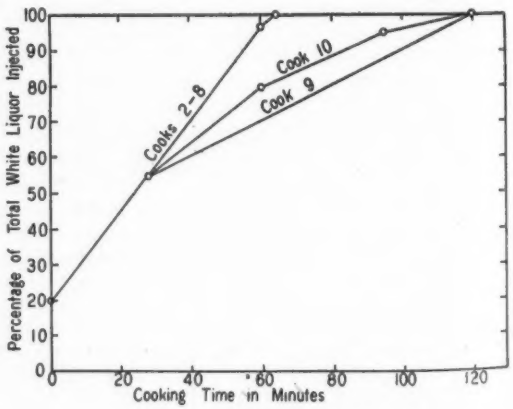

Fig. 3
Injection Schedules

TABLE I.—COOKING DATA

Cook	Moisture-free wood	Impregnation—45 min. at 120 deg. C. and 120 lb./sq. in. Liquor in g. NaOH/liter			Liquor Left in Digester Liquor out volume g. NaOH/liter			Injection Liquor g. of Na_2O		Volume[a]	Concentration g. NaOH/liter as Na_2O		Volume injected	Total Liquor during Cook g. of Na_2O			Percentage Na_2O On Wood		Liquor to wood ratio	Time to Temperature at max. temp. min.	Max. temp. deg. C.	Black Liquor from Cook g. of Na_2O per liter		
		Volume cc.	NaOH	NaS	Volume cc.	NaOH	NaS	Total	as NaOH	as NaS	cc.	as NaOH	as NaS	cc.	as NaOH	as NaS	Total volume	NaOH	NaS				as NaOH	as NaS	Total alkali
1	4627	....	....	....	....	....	....	....	....	....	18238[b]	101.0	50.5	4892[b]	530.0	271.7	23130	11.5	5.8	5:1	75	185	175	5.3[f]	....	46.0
2	4632	37200	2.08	1.5	19371	1.5	0.71	27.5	48.3	42.0	20041	185.5	29.7	3119	626.3	134.6	23160	13.5	2.9	5:1	65	115	175	6.9[f]	....	39.5
3	5645	38800	2.94[a]	....	21699	0.0[d]	....	0.0	114.0[a]	....	24420	185.5	29.7	3805	819.0	113.0	28225	14.5	2.0	5:1	60	190	165	3.7[f]	....	61.0
4	4642	41120	3.65[a]	....	23030	0.2	....	0.2	141.8[a]	....	20980	185.5	29.7	3126	721.8	92.8	23216	15.5	2.0	5:1	65	115	175	2.5[f]	....	46.0
5	4642	37500	3.83	0.34	20930	1.0	0.33	21.0	141.8[a]	....	20135	185.5	29.7	3129	705.6	101.0	21240	15.1	2.17	5:1	65	115	175	3.0	1.1[f]	33.0
6	4642	36000	1.75	1.44	18589	0.67	0.44	23.6	31.1	8.1	20107	185.5	29.7	3125	630.6	134.9	23220	13.6	2.9	5:1	65	115	175	4.2	0.41	42.0
7	4632	33422	2.04	0.92	16515	0.4	0.39	27.2	50.5	42.1	20085	185.5	29.7	3120	641.1	117.3	23205	13.8	2.53	5:1	65	115	175	3.55	0.39	33.8
8	4632	34102	2.72	0.78	17088	1.0	0.56	26.6	108.9	17.0	19805	185.5	35.7	3360	647.7	137.0	23160	14.0	2.95	5:1	65	115	175	5.45	0.87	39.2
9	4672	38168	3.3	0.61	19000	0.70	0.27	29.8	101.5	13.6	19930	155.5	36.0	3425	634.5	137.0	23360	13.5	2.96	5:1	65	115	175	4.65	0.69	29.4
10	4642	38178	3.6[a]	0.59	18393	0.31	0.21	5.0	131.3	18.5	19785	154.0	36.1	3425	659.3	142.5	23216	14.2	3.07	5:1	65	115	175	5.5	0.71	23.8

[a] Volume includes volume of water as moisture in chips.
[b] Added to chips with white liquor before cook. [c] Not injected, but added to chips before cook. [d] Values of alkali titratable to pH 9. (NaOH + 1/2NaS). [e] Black liquor below pH of 9.0. [f] Values of alkali titratable to pH 9. [g] Weak white liquor used instead of black liquor. [h] Values of alkali titratable to pH 9.

TABLE II.—PULP PROPERTIES

Cook	Screened yield	Unscreened yield	Permanganate number	Freeness (Schopper-Riegler) vs. beating time 5	25	45	65	Basis Weight in Pounds per ream 25x40—500 5	25	45	65	Apparent Density vs. beating time 5	25	45	65	Bursting strength mullen points per 100 lb. per ream 5	25	45	65	Tear factor g. per lb. per ream 5	25	45	65	Strength Factors at 500 Free ness Burst	Tear
C	Commercial slush pulp		29.0	850	795	620	340	47.5	47.5	47.5	47.5	11.5	13.4	14.7	15.3	80	138	154	160	2.62	1.52	1.34	1.16	157	1.23
1	45.2	46.2	30.3	860	795	600	370	47.2	47.1	47.2	47.0	11.5	13.2	14.1	14.9	100	144	161	162	2.31	1.50	1.25	1.15	162	1.20
2	45.6	46.2	31.0	845	815	700	510	48.6	48.2	47.7	47.9	10.1	12.8	13.8	14.4	89	135	162	176	2.64	2.0	1.57	1.41	177	1.43
3	50.0	51.5	37.4	860	835	765	555	46.8	46.3	47.7	46.8	10.0	12.0	13.2	14.2	79	130	151	162	2.46	1.8	1.34	1.16	162	1.13
4	40.2	49.1	32.9	850	770	570	280	46.4	47.7	47.2	47.0	10.6	12.9	14.2	15.0	93	147	158	151	2.34	1.55	1.22	1.12	161	1.20
5	46.5	47.8	36.0	840	820	590	360	47.4	47.0	45.7	46.9	9.5	12.1	13.4	14.5	93	136	155	164	2.50	1.68	1.30	1.10	162	1.19
6	46.3	46.9	31.3	825	790	670	500	48.3	47.5	48.5	47.1	10.9	12.8	13.9	14.4	103	143	161	167	2.72	2.02	1.59	1.49	177	1.48
7	46.8	47.2	35.0	840	800	500	200	48.3	48.5	47.8	48.5	11.2	13.6	14.8	15.8	115	159	172	159	2.38	1.69	1.41	1.38	172	1.41
8	47.4	47.9	34.8	850	795	600	290	47.0	48.5	47.1	46.8	11.0	13.4	14.5	15.3	106	153	175	166	2.47	1.71	1.56	1.47	176	1.43
9	45.3	46.0	32.2	845	785	590	290	46.8	46.5	46.7	47.0	11.8	14.0	15.1	16.0	105	144	167	154	2.44	1.68	1.35	1.27	168	1.31
10	44.3	44.8	28.1	850	800	550	330[i]	48.0	47.0	46.0	46.8[i]	11.5	13.2	14.5	15.1[i]	108	145	163	159[i]	2.40	1.62	1.39	1.28[i]	163	1.35

[i] Sample removed from beater at 60 minutes.

cording to TAPPI Standard T 205 m-36. The freeness at each interval was determined with the Schopper-Riegler freeness tester, using a consistency of 0.2% and a temperature of 20 deg. C.

The test sheets were conditioned overnight at 70 deg. C. and 65% relative humidity before testing and were tested for basis weight, caliper, bursting strength, and tearing resistance. All tests were made according to Institute methods.

Discussion of Results

The cooking data are presented in Table I, and the data for the properties of the resulting pulps are given in Table II. In Table I, chemical ratio includes all of the active chemical present during the latter half of the cook, including the chemical taken from the impregnating liquor, and that injected as cooking liquor. A chemical ratio of 17% with but slight unavoidable variation was used in each of the cooks. In all the cooks, the liquor to wood ratio was 5:1. In Table II, Sample C is a typical commercial kraft pulp, obtained in slush form and evaluated by a standard laboratory beater run. Comparison of the strength properties of the pulps is made at 500 freeness at which they were usually at a maximum.

The properties of the pulps from Cooks 2, 6, and 7 show that it was possible to obtain a pulp with better than average kraft characteristics by the use of a cooking liquor of low sulphidity. These results were obtained by injecting the liquor during the cook after a preliminary impregnation with black liquor. The pulps so obtained were 10% higher in maximum bursting strength and 15% higher in maximum tearing resistance than average kraft pulps, although the sulphidity of the cooking liquor was only 14%. This indicated that injection of this cooking liquor under the given conditions was more efficient in maintaining a low causticity during the cook than the buffering action of the sulphide in a normal kraft liquor. For best results, the chips had to be provided with a medium for even distribution of the injected liquor throughout the wood charge, thus preventing high concentrations of chemical in localized areas. Furthermore, the use of black liquor for this preliminary impregnation had a definite advantage over the use of white liquor of the same active chemical content, as is shown by a comparison of Cooks 8 and 10. Apparently the organic salts present in the black liquor during injection of strong liquor acted as buffering agents. This buffering action helped to pre-

vent large variations in chemical concentration throughout the cooking mass or the momentary exhaustion of chemical in spite of any momentary lack of agreement between the rates of consumption and injection.

The analyses of the black liquors showed that a large proportion of the sodium sulphide, as well as of the sodium hydroxide, was absorbed by the chips during impregnation under the given conditions. With a definite amount of sulphide in the cooking liquor, as in Cooks 2 to 7, the sulphide content of the impregnating liquor was an important factor in the quality of the resulting pulp. This indicated that the sulphide supplied by the cooking liquor in these cooks was not quite sufficient to produce the highest quality pulp. By raising slightly the amount of sulphide in the impregnating liquor, the total sulphide available was sufficient to give the optimum pulp properties. Under these conditions there was a certain critical range of values for the total sulphide supplied, within which a small variation in either direction caused a marked effect on the resulting pulp strength. Lower quality pulps resulted from those cooks in which the total sulphide added to the digester was 2.2% or less (based on the dry wood). From cooks in which the sulphide added was above 2.5%, a high quality pulp was obtained. The critical range described must lie between 2.2 and 2.9%. It is apparent that the total amount of sulphide required for optimum properties under the given conditions was some definite value slightly above 2.5%. This critical value for the sulphide probably corresponded to the amount that was required for combination with the lignin in the wood.

All the pulps produced by combining impregnation with the injection of a low sulphide cooking liquor were at least as high or higher than the standard pulp in strength properties. The odor produced during this cooking procedure was noticeably less than that formed in the normal kraft process.

In mill practice, the process could be made continuous by using a sulphidity of about 17.5% in the cooking liquor, so that the black liquor obtained at the end of one cook would be suitable for impregnation of the succeeding cook. This is indicated by the analysis of the black liquor from Cook 8, in which the sulphidity mentioned above was used. After impregnation the black liquor would be sent to the recovery system. In this way the unconsumed chemical in the black liquor sent to the recovery would be considerably less than in conventional operations, and no black liquor would contact more than two charges of chips.

The results of the last three cooks confirmed the fact that the presence of black liquor during the cook results in a darker pulp than when no black liquor is used. However, most kraft mills find it economically necessary to use black liquor as a diluent in cooking. When the black liquor used for impregnation in the process described by this paper had not been used previously, the resulting pulp was slightly better in color and lower in permanganate number than an average kraft pulp. When the black liquor had been used once or twice before, the pulp was noticeably darker than the average. In actual mill operations there would be no necessity for using a black liquor more than once for impregnation before sending it to recovery, and under these circumstances pulp of a lighter color would result.

In applying injection cooking to mill operation, a difficulty might arise in obtaining proper distribution of the injected liquor throughout the chips. This is especially probable in the case of rotary digesters, which require from 10 to 12 minutes for a complete revolution and several revolutions for a complete mixing. A more extensive piping system within the rotary would result in more rapid distribution of the injected liquor, but it is questionable that the best results could be obtained without positive circulation. However, the combination of forced circulation and indirect heating, as used in the experimental digester, has proved advantageous in commercial kraft pulping. Where this type of digester is in use, the cooks could be carried out as explained above, using steam instead of nitrogen for forcing the liquor into the circulating system, and insulation on the white liquor chamber to prevent excessive condensation. Some recent installations of commercial kraft digesters with forced circulation have been reported *(12)* to give a complete turnover of liquor every five minutes. This rate of turnover is in the same range as that obtained in this series of experimental cooks, and the pulps obtained should therefore be equally uniform.

Conclusions

The benefits derived from the buffering action of the sulphide in a normal kraft liquor were obtained by continuous injection of a liquor of low sulphidity during cooking.

The pulps resulting from injection cooks were 10% higher in maximum bursting strength and 15% higher in maximum tearing resistance than average kraft pulps.

At least in pulping conifers, a small but definite amount of sodium sulphide was necessary to obtain optimum pulp properties.

A more complete utilization of active chemical is possible by employing preliminary impregnation with black liquor.

The organic salts present in the black liquor during injection of strong liquor acted as buffering agents in maintaining even distribution of the active chemical.

A marked reduction in mercaptans and other substances causing objectionable odor was obtained by using a cooking liquor of low sulphidity.

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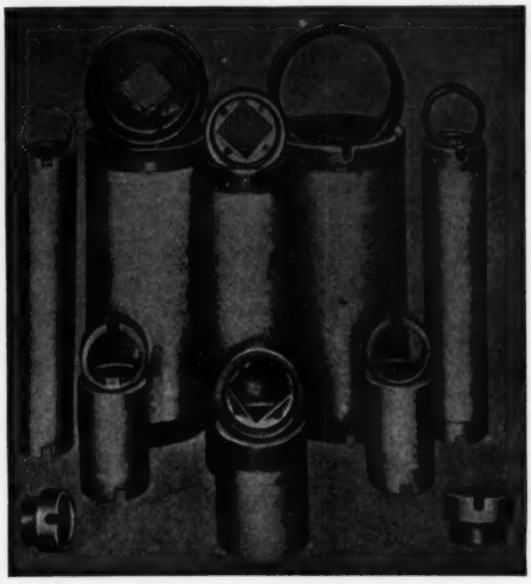


ELIXMAN

C A P S

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

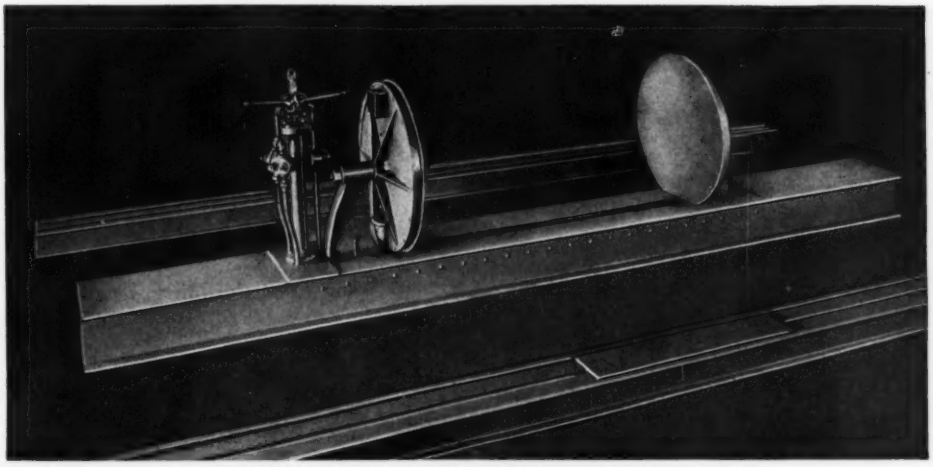
C O R E S

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

W. & W. HEADING MACHINE



Furnished complete ready for installation. Operated by compressed air. Heads heated by steam or electricity. Built to suit different diameters and lengths of rolls. When installed only heads and supporting stands appear above floor line. Transfer trackage and shuttle cars furnished also.

Built in association with Williams & Wilson Limited, Montreal.

Montague Machine Company

Turners Falls, Mass.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING AUGUST 23, 1941

SUMMARY

Newsprint .....10,385 rolls

NEWSPRINT

H. G. Craig Co., Inc., ———, Donnacona, 326 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 331 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 367 rolls.
———, ———, Liverpool, N. S., 2,279 rolls
H. G. Craig Co., Inc., ———, Donnacona, 364 rolls.
———, ———, Cornerbrook, 2,406 rolls.
H. G. Craig Co., Inc., Donnacona, 395 rolls.
———, ———, Liverpool, N. S., 2,170 rolls.
Perkins Goodwin & Co., ———, Botwood, 1,747 rolls.

RAGS, BAGGINGS, ETC.

Kauders Steuber Co., ———, Santos, 471 bls. cotton linters.
———, ———, Rio de Janiero, 356 bls. cotton linters.
National City Bank, ———, Rio de Janiero, 36 bls. cotton linters.
———, ———, Rio de Janiero, 68 bls. cotton waste.
———, ———, Santos, 46 bls. linen waste.
———, ———, Santos, 529 bls. cotton linters.

GLUE STOCK

E. J. Lang, ———, Buenos Aires, 59 bls.
Manufacturers Trust Co., ———, Buenos Aires, 21 bls.
Chase National Bank, ———, Buenos Aires, 10 bls.

CASEIN

Tupman Thurlow & Co., Inc., ———, Buenos Aires, 833 bags.

WOOD PULP

Cellulose Sales Co., ———, Botwood, 3,327 bls. ground wood pulp, 226 tons.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 23, 1941

J. W. Higman Co., ———, Avonmouth, 314 tons china clay.
United Clay Mines, ———, Avonmouth, 1,382 tons china clay.
Paper Makers Importing Co., ———, Avonmouth, 356 tons china clay.

Pagel, Horton Celebrate 25th

On September 1, Pagel, Horton & Co., 347 Madison avenue, New York, will observe its 25th anniversary. The concern was incorporated September 1, 1916.

During its existence Pagel, Horton & Co. has imported Swedish pulp having a value of over $150,000,000. In 1938, the company began the importation of Norwegian newsprint and in 1940 took up the importation of crude rubber.

Waste Paper Committee Formed

A large group of waste paper consumers, including large and small mills, have undertaken a program whereby it is hoped the saving of waste paper will be appreciably stimulated. To date 37 paperboard mills have enrolled in this activity, and it is expected that many of the roofing mills, as well as book paper mills will also cooperate. The list of consumers of waste paper participating in this work has been increasing daily.

It is planned to use spot radio announcements, newspaper advertisements and signs stressing the need for waste paper as a material essential to national defense and that waste paper is of value and that it is patriotic to save and sell it. Prospective savers of waste paper will be urged to make use of existing facilities for the collection and handling of waste paper wherever such facilities are available. As at present contemplated, the program will be centered in 34 key cities, north, east, south, and west to the Rocky Mountains.

The committee in charge, which is known as the Conservation Committee of the Waste Paper Consuming Industries, as at present constituted, consists of the following:

Chairman, W. H. Beckwith, vice-president, Morris Paper Mills, Morris, Ill. Members: J. J. Brossard, vice-president, Container Corporation of America, Philadelphia; Norman F. Greenway, vice-president, Robert Gair Co., New York; H. M. Kieckhefer, vice-president, Kieckhefer Container Company, Camden, N. J.; C. E. Nelson, president, Mac Sim Bar Paper Company, Otsego, Mich.; G. G. Otto, vice-president, Alton Box Board Company, Alton, Ill.; and secretary-treasurer, H. S. Adler, 80 E. Jackson blvd., Chicago, Ill.

The total cost of the program may approximate a half million dollars. About one-fourth of this sum had been paid in as of August 25, 1941. The agency handling the advertising is Olian Advertising Company, Boatmen's Bank Building, St. Louis, Mo.

Powell River Builds Sulphite Plant

Contract has now been awarded for the new sulphite plant of the Powell River Company at the company town of Powell River, B. C. The general contract has been placed with Smith Brothers & Wilson Ltd., 1267 Richards street, Vancouver, B. C.

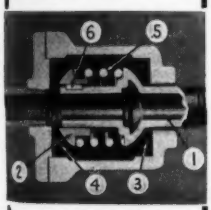
Work has already been commenced by the contractors on preliminary operations, a subcontract having been placed with Murphy Excavating Company, Ltd., 1466 West 6th avenue, Vancouver. Approximately 8000 to 10,000 yards of material will be removed for installation of foundations. The general contractors expect to take about four months or so to complete the big plant building.

Paying their own way

64 JOHNSON JOINTS at KNOWLTON BROTHERS

Here's Real Acceptance

• Knowlton Brothers, Watertown, N. Y., is just one of a hundred paper mills that have purchased 50 or more Johnson Joints. Over fifty mills have purchased from 100 to as many as 800.



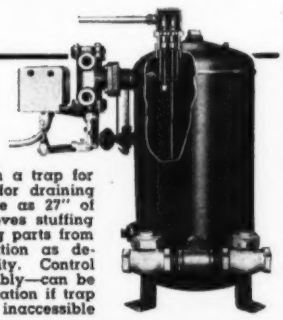
Johnson Rotary Pressure Joint

•Nipple (1) fastened to roll. Sliding collar (2), keyed (6) to nipple. Carbon graphite seal ring (3) and bearing ring (4) eliminate oiling and packing. Spring (5) is for initial seating only—in operation joint is pressure sealed. Note how ball and socket joints at rings provide angular flexibility — how space between nipple and housing allows lateral movement, and also keeps syphon pipe from rubbing on dryer journals.

WHEN Johnson Joints go in, all your steam fit troubles go out. For this modern, packless "stuffing box" never needs to be oiled or repacked, adjusts itself automatically for varying pressures, and even absorbs lateral and angular misalignment without loss of operating efficiency. It stops the endless servicing demanded by the old style steam fits—saves valuable production time that is wasted when machines are shut down to repack or replace steam fits. No wonder users report that the Johnson Joint quickly pays for itself.

In the light of such important savings, don't you think it's wise to examine your own steam fits? You might coax a few more years of service out of them with enough tinkering. But the money you spend for that maintenance alone would very likely pay the cost of switching over to Johnson Joints now.

WRITE for new Bulletin which shows a size and style of the Johnson Joint to fit every paper machine, calender or corrugator.



Use the Johnson Electrap

• Today's highest development in a trap for pumping or lifting service, and for draining systems under vacua as complete as 27" of mercury. Electric operation removes stuffing boxes, floats and all other moving parts from the trap chamber, makes operation as dependable as the flow of electricity. Control valve gear is one compact assembly—can be brought out to any convenient location if trap chamber must be mounted in inaccessible position. Ask for new bulletin.

The Johnson Corporation

828 WOOD STREET THREE RIVERS, MICH.

THE outstanding success of Witco carbon blacks is due in no small part to the company's research activity in improving the quality of this product and adapting it to the changing needs of industry. This activity today continues on an even more intensive and extensive scale.

In Wishnick-Tumpeer's new research laboratory, completely air conditioned and equipped with the finest facilities, our staff strives constantly to increase the efficiency of carbon black and to promote, through skilled laboratory cooperation, profit and economy for customers using this important material.

WISHNICK-TUMPEER, INC.

Manufacturers WITCO *and Exporters*

New York, 295 Madison Avenue • Boston, 141 Milk Street • Chicago, Tribune Tower • Cleveland, 616 St. Clair Avenue, N. E. • Witco Affiliates: Witco Oil & Gas Company • The Pioneer Asphalt Company • Panhandle Carbon Company • Foreign Office, London, England.

New York Paper and Pulp Market Review

Heavy Government and Regular Trade Purchasing Continue To Maintain A Very Strong Paper Market—Pulp Market Tight With Possibility of Higher Last Quarter Prices On Few Higher Grades.

Office of the PAPER TRADE JOURNAL,
Wednesday, August 27, 1941.

Heavy volume of orders with increasing difficulty in supplying the unprecedented demand for paper and paper board, continues to be reflected in reports received from many manufacturers' representatives, jobber, and general paper merchants during the current week.

As the international scope of the defense program unfolds, indications are appearing to substantiate Government warnings that the production and distribution of non-defense materials and products is almost certain to be conducted with increasing difficulty in the future. One recent estimate that the Government will require 40% of the productive capacity of the paper industry, is viewed with concern in some quarters of the trade; while other opinions reflect the prevailing uncertainty of the business outlook.

The index of general business activity for the week ended August 16 advanced to 130.9%, from 130.6% for the previous week, compared with 108.4% for the corresponding week last year. Paper board production was 3.1% higher.

Paper production for the week ended August 16 was estimated at 101.1%, compared with 87.3% for 1940, with 81.9% for 1939, with 78.0% for 1938, and with 83.7% for the corresponding week for 1937.

Paper board production for the week ended August 16 was 92.0%, compared with 73.0% for 1940, with 72.0% for 1939, with 67.0% for 1938, and with 74.0% for the corresponding week for 1937.

Trade reports at this date appear to be more deeply concerned about the delivery of paper than about prices. The same attitude is reflected in the wood pulp market. The current paper price situation is generally viewed in the industry as unsatisfactory, as too wide a difference exists between pulp prices and paper prices. From some quarters of the trade comes the opinion that pulp prices are not too high but that paper prices are too low.

No important change in prices on any grade of paper has been reported at this date.

Chemical Pulp

The market situation of all grades of chemical wood pulp is tight. It is reported in some quarters of the trade that prices for the last quarter of the current year, except on some of the higher grades, will probably remain unchanged. A few of the higher grades of kraft, unbleached and bleached sulphite pulp may be slightly higher. On the regular run of grades no change from current contract prices is expected within the pulp trade.

The spot market is now reported practically bare of supplies.

Rags

New cotton rags continue active. The only important change at this date is on the blue overall grade, which has advanced and currently quoted at from 5.00 to 5.25.

Roofing rags are firm with a good demand reported continuing from Canadian mills. Prices on all grades are unchanged.

Old Rope and Bagging

Less activity is reported in scrap bagging this week. No important change in prices or in the general market situations has been reported to date.

The market position of old Manila rope is strong. Mill buying continues to steadily absorb about all the supplies available. Prices are unchanged.

Old Waste Paper

Old waste paper prices are very firm under a heavy demand for the lower grades. The question of an adequate supply of these grades to maintain the current high production ratio of board mills is considered more serious within the trade.

White shavings are reported in more demand at this date. White envelope cuttings are higher and currently quoted at from 3.75 to 4.00, and ordinary hard cuttings at from 3.00 to 3.25. All other grades of paper stock are unchanged.

Twine

The market position of most grades of twine continues strong. Cordage mills are unable to fill all orders and manufacturers have been forced to continue reservations to limit quantities to their customers. Imported fibers are becoming scarce and no relief from the present situation is forseen at this date. Prices are firm on all grades.

Wood Pulp on Control List

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 27, 1941—A long list of additional commodities have been placed under export control through new instructions from the President. The commodities include practically all wood pulp.

It is stated that the inclusion of these articles under export control would bring the total list of controlled commodities up to approximately 80% of the total value of exports for the first five months of this year.

J. P. Lewis Issues Folders

Folders just introduced by the J. P. Lewis Company, Beaver Falls, N. Y., with sales office at 270 Broadway, New York, show commercial printed specimens of two of the company's mill brands, Beaverland Embossed and Lewistrong Leatherette.

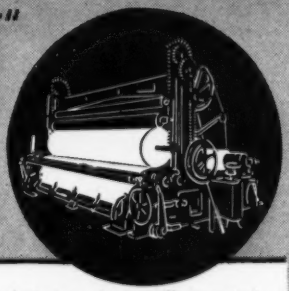
ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

"OUR OPERATORS ARE GREAT BOOSTERS FOR YOUR EQUIPMENT"



A well-known manufacturer, whose mill is noted for modern and efficient operation, installed a Camachine 19, width 181", several years ago. The owner says:
"Last year we replaced the two-drum winder of another make on our No. 2 machine with your Type 19, 166" CAMACHINE. This also is giving us most satisfactory service.
"You can be proud of these two installations. We have had practically no maintenance on them, and our operators are great boosters for your equipment."

Write for interesting folder to

CAMERON MACHINE COMPANY
61 Poplar Street, Brooklyn, N. Y.

CAMACHINE

PRICE & PIERCE ltd

Wood Pulp & Paper Agents

60 EAST 42 ST NEW YORK CITY

J. Andersen & Co.
Selling Agents
21 East 40th Street
New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanaffärden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

Bleached Sulphite
KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

Unbleached Sulphite
AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakia
SVANÖ AKTIEBOLAG
Svanö, Sweden

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, August 27, 1941.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is currently quoted at $50 per ton, f.o.b., works. Demand reported moderate for the week.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported active for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are firm, with prices a little higher for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 24 cents per pound; 80-100 mesh, at 24½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, is currently offered at 23 cents per pound. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic sode are firm and continue unchanged at prevailing market prices. Demand reported active. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, car lots, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Demand heavy. Market under mandatory priority ruling. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with prices higher on some grades. "G" gum rosin is currently quoted at $2.47 per 100 pounds, in barrels. Savannah "FF" wood rosin is currently quoted at $2.47 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.97 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm and nominal. Demand active. Domestic salt cake is currently quoted at $15 per ton, in bulk; chrome cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16 per ton imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported good for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and are reported unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported good for the current week. The commercial grades are currently quoted at $1.15; iron free at $1.80 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$6.00
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.50	"	5.00
Standard Wrapping	4.50	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.07½	"	—
White No. 1 M. G.	.97½	"	—
White No. 1½	.85	"	—
White No. 2	.85	"	—
Anti-Tarnish M. G.	.90	"	—
Colored	1.00	"	—
Kraft	.90	"	—
Manila	.80	"	—
Unbl. Toilet, 1 M.	4.14	"	—
Bleached Toilet	5.60	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	3.80	"	—
Bleached, Jr.	2.30	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.75	@	10.75
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	45.00	@	—
Chip	45.00	"	—
Sgl. Mla. Ll. Chip	60.00	"	—
White Pat. Coated	75.00	"	—
Kraft Liners	60.00	"	—
Binders Boards	80.00	"	—

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10 @ $46.00		$40.25 @ $47.25
100% Rag	31.05 " 36.50		32.20 " 37.75
85% Rag	.... "		29.90 " 35.00
75% Rag	23.60 " 27.75		24.75 " 29.00
65% Rag	.... "		21.65 " 26.25
50% Rag	17.55 " 21.50		18.70 " 22.75
25% Rag	14.65 " 17.75		15.80 " 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$9.35 @ $11.50	$11.55 @ $12.75
No. 2	8.50 " 10.25	9.65 " 11.75
No. 3	8.05 " 9.25	9.20 " 11.25
No. 4	7.70 " 9.50	8.90 " 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—	
Moist	No prices
Dry	No prices

(Delivered)

No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	4.50
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	4.25
Strong Unbleached Sulphite	3.17½	"	4.25
News Grade, delivered			
Unbleached Sulphite	61.00	"	64.25

(On Dock, Atlantic Ports)

Kraft Bleached	4.12½	"	—
Kraft Light & Strong	No price		
Kraft No. 1	3.60	"	4.75

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	2.75	"	3.37½

(Delivered)

Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.00	@	7.25
Silesias No. 1	4.25	"	4.50
New Unbleached	7.00	"	7.25
Blue Overall	5.00	"	5.25
Fancy	2.50	"	2.75
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.10	"	3.35
Miscellaneous	2.35	"	2.65
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.25	"	1.35
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.30	"	1.35
No. 2	1.20	"	1.25
No. 3 (bagging)	.95	"	1.00
No. 4	.90	"	.95
No. 5A	.90	"	.95

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

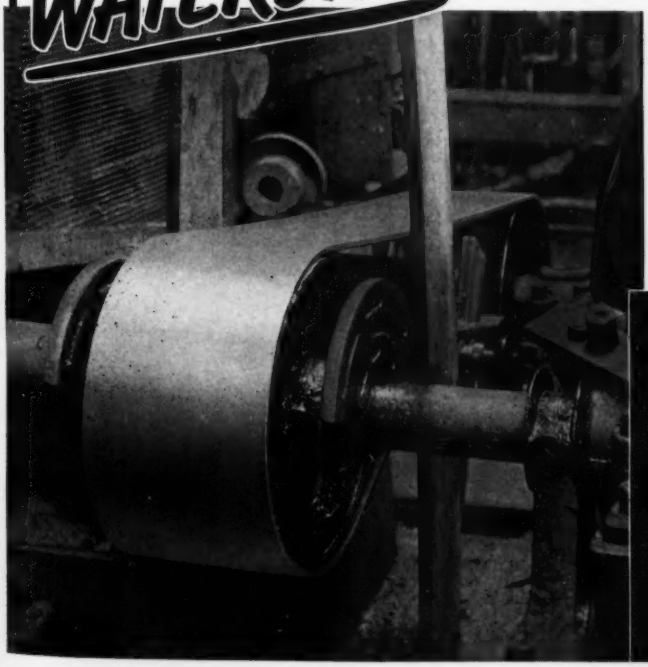
More than just a TRADE MARK

EXCELSIOR Woolen Co. KNOX Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 75 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.

WATERSHED...a FACT—*not just a name*



TANNATE WATERSHED is the ideal Leather Belting for the humid conditions existing in paper mills. It is made with waterproof cement and treated to resist moisture so that even when damp it will carry nearly full load with laps and plies staying cemented. Tannate is noted for great strength, high coefficient of friction and flexibility. Use it for increased production and low cost output. Write us for full particulars.

J. E. RHOADS & SONS, 35 North Sixth St., Phila., Pa.
New York • Chicago • Atlanta • Cleveland

STEP UP PRODUCTION WITH

RHOADS *Tannate* WATERSHED LEATHER BELTING

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.15	@	4.25
Wool Tares, light....	2.50	"	2.75
Wool Tares, heavy..	2.50	"	2.75
Bright Bagging.....	3.15	"	3.30
Manila Rope—			
Foreign	6.00	"	6.25
Domestic	6.00	"	6.25
Jute Threads.....	3.50	"	3.75
Sisal Strings	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.75	@	4.00
Ordinary Hard White No. 1....	3.00	"	3.25
Soft White No. 1..	2.50	"	2.75
Sott White Extra..	2.70	"	2.85
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book...	.90	"	.95
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	2.10	"	2.15
Ledger Stock Colored	1.75	"	1.90
Manila—			
New Env. Cut....	3.25	"	3.50
New Cuttings.....	3.00	"	3.25
Old Kraft Machine Compressed bales..	1.75	"	2.00
News—			
No. 1 White News	1.50	"	1.60
Strictly Overissue.	.75	"	.80
Strictly Folded....	.65	"	—
Corrugated	.82½	"	—
No. 1 Mixed Paper..	.57½	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.20	@	—
White Hemp.....	.20	"	—
Fine Polished—			
Fine India.....	.24	"	—
Unpolished—			
Box	.16¼	"	—
Paper Makers.....	.16	"	—
Tube Rope.....	.17½	"	—
Wall Paper.....	.19½	"	—
Wrapping	.21	"	—
Soft Fiber Rope...	.18	"	—
Cotton	.24	"	—

(Hard Fiber)

Medium Java.....	.15	"	—
Mex. Sisal.....	.14	"	—
Manila	.26	"	—
Jute Carpet Threads.	3.00	"	3.25
Bleachery Burlap....	7.50	"	8.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	4.25	"	—
Scrap Sisal.....	3.25	"	3.50
Scrap Sisal for Shredding	3.25	"	3.50
Wool Tares—			
Foreign	(nominal)		
Domestic	4.00	"	4.25
Aust. Wool Pouches.	4.50	"	4.75
New Burlap Cuttings	5.50	"	5.75
Heavy baling bagging	4.25	"	4.50
Paper Mill Bagging..	3.50	"	3.75
No. 2 Bagging.....	.60	"	.75

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.03¾	"	4.00
New White No. 1.	.07¼	"	.07¾
New Light Flannelettes	.05¼	"	.05¾
Canton Flannel, Bleached	.06¾	"	7.00
Underwear Cutters, Bleached	.06¾	"	7.00
Silesias No. 1.....	.04¼	"	.04½
New Black Silesias..	4.00	"	—
Red Cotton Cuttings	.03½	"	4.00
Soft Unbleached.....	.07	"	.07¼
Blue Cheviots.....	.04½	"	.04¾
Fancy	.01¾	"	.02
Washable	.01¾	"	—
Cottons—According to Grades—			
Blue Overalls.....	.04¼	"	.04½
New Black, Soft..	.03	"	.03¼
Khaki Cuttings.....	.02¼	"	.02½
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.02	"	.02¼
New Canvas.....	.05½	"	—
B. V. D. Cuttings...	.06¼	"	.07

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	"	2.25
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	1.75	"	2.00
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues....	1.50	"	—
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.25
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons.....	(nominal)
Dutch Blues.....	(nominal)
New Checks and Blues	(nominal)
Old Fustians.....	(nominal)
Old Linsey Garments.	(nominal)
New Silesias.....	(nominal)

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.06¾	@	.07
New White No. 2.	.04	"	.04¼
Light Silesias.....	.04½	"	.04¾
Silesias, No. 1....	.04	"	.04¼
Black Silesias, soft	—	"	.03
New Unbleached...	.06½	"	.06¾
Washable Prints..	.02½	"	.03
Washable No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01½
Fancy Percales....	.03	"	.03¼
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03	"	.03¼
No. 2 Mixed.....	.02	"	.02¼
Corduroy	.01¼	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	Nominal		
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1....	1.35	"	1.40
Domestic No. 2...	1.15	"	1.20
Roofing Bagging..	1.05	"	1.10

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	3.25	@	3.75
Domestic	3.50	"	3.75
Manila Rope.....	—	"	5.50
Sisal Rope.....	3.50	"	—
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	3.25	"	3.50
No. 2.....	—	"	1.50
Wool Tares, heavy...	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.25	"	3.50

Old Papers

(F. o. b. Phila.)

Shavings—			
Hard White Special	3.15	@	3.20
Hard White.....	2.90	"	3.00
No. 1 Soft White..	2.40	"	2.45
No. 2 White.....	1.85	"	1.90
No. 1 Mixed.....	1.20	"	1.25
Solid Ledger Stock..	2.00	"	2.10
Ledger Stock, white.	1.80	"	1.90
Ledger Stock, colored	1.70	"	1.75
No. 1 Books, heavy..	1.25	"	1.30
Manila Cuttings.....	2.25	"	2.30
Print Manila	.75	"	.80
Container Manila....	.65	"	.70
Kraft Paper.....	1.75	"	1.80
No. 1 Mixed Paper..	.57½	"	—
Straw Board Chip...	.50	"	—
Binders Board Chip..	.50	"	—
Corrugated Board....	.80	"	—
Overissue News.....	.85	"	.90
Old Newspapers.....	.65	"	—

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	3.85	@	4.00
No. 1 Soft White.	2.75	"	3.00
No. 2 Mixed.....	.90	"	1.00
Solid Ledger Books.	2.25	"	2.50
Overissue Ledger Stock	1.75	"	2.00
White Ledger Stocks	1.50	"	1.65
Mixed Ledgers	1.25	"	—
No. 1 Heavy Books..	1.20	"	1.25
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock	1.15	"	1.20
Manila Env. Cuttings	3.00	"	3.25
Manila Envelope Cuttings, extra quality	3.00	"	3.25
White Blank News..	1.70	"	1.80
No. 1 Kraft.....	1.90	"	2.00
Extra No. 1 Kraft..	2.15	"	2.25
Mixed Papers.....	.57½	"	—
Print Manila.....	.70	"	—
Container Manila....	.65	"	.75
Old Newspapers.....	.65	"	—
Paper Wool Strings.	1.30	"	1.35
Overissue News.....	.65	"	.70
Box Board Chips....	.35	"	—
Corrugated boxes....	.80	"	.90
Kraft corrugated boxes	1.50	"	1.60
New Kraft Corrugated Cuttings....	2.00	"	2.25
Screening Wrappers.	.85	"	.90

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.50	@	4.60
Sisal Rope	3.50	"	—
Mixed Rope.....	1.00	"	1.25
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Soft Jute Rope.....	4.75	"	5.00
Manila Rope—			
Foreign .....(nominal)			
Domestic	6.00	"	6.25

J. L. Ritchie Joins OPM

The American Paper and Pulp Association, E. W. Tinker executive secretary, 122 East 42nd St., New York, announces that J. L. Ritchie, who has for the past two months been in charge of the Association's Washington office, has been employed by OPM. Mr. Ritchie's position in the Pulp and Paper Section of OPM will be that of general supervision of priority activities for the pulp and paper industry as well as converted paper products and the printing industry.

Mr. Ritchie is being succeeded by John F. Darrow, formerly with the Bureau of Foreign and Domestic Commerce. Mr. Darrow has been spending part of his time in the Pulp and Paper Section of OPM, being primarily employed in the Consumption Materials Unit of the Bureau of Foreign and Domestic Commerce. Companies needing action or information with respect to priorities should continue to forward their requests to the Association's office in New York, where, if necessary, they will be transmitted to Washington for individual attention on Mr. Darrow's part.

Russell Madden Leaves A. W. P. Co.

T. H. Blodgett, chairman of the board of the American Writing Paper Corporation, and L. M. Yoerg, president, announce with regret that Russell S. Madden has applied for his withdrawal from the American Writing Paper Corporation, both as vice-president and director.

Mr. Madden came to Holyoke on August 1, 1923 when S. L. Willson was president. He originally served as assistant general sales manager under George J. Cadwell, general sales manager, whom he succeeded in May, 1928, at the time of Mr. Caldwell's death. Two years later, he was elected vice-president, in which capacity he served until the reorganizataion of the company in 1937. At this time he was elected First vice-president and director, which position he has held since that time.